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*Canada, Agriculture, Dept. of. Prairie Farm  
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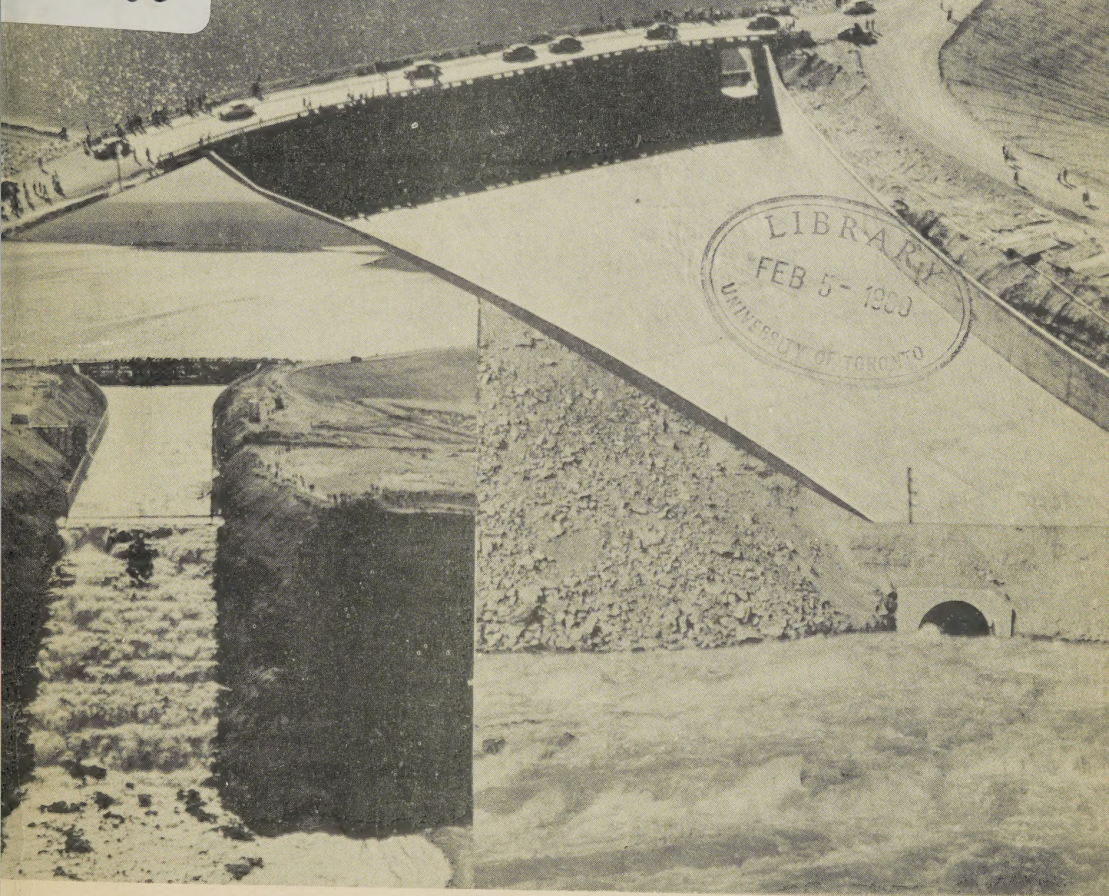
# REPORT

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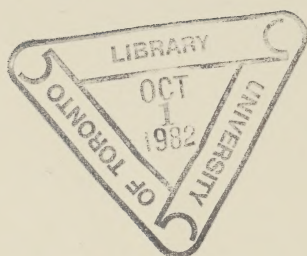
ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1951-52

CAI VA 20

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CANADA DEPARTMENT OF AGRICULTURE  
Prairie Farm Rehabilitation Branch  
Regina, Sask.





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## INTRODUCTION

This Report covers two related fields of activity (1) operations under the Prairie Farm Rehabilitation Act and (2) works and surveys carried out in the four western provinces, under special votes for the irrigation, reclamation and development of agricultural lands. The Prairie Farm Rehabilitation Branch, with headquarters at Regina, administers both P. F. R. A. and the special projects.

The Prairie Farm Rehabilitation Act was passed in 1935 to undertake, over a five year period, methods of farm practice and water development to minimize drouth problems on the prairies. An amendment in 1937 extended the activities to the withdrawal of poor lands from cultivation and to the resettlement of farmers from such lands in the drouth area. Provision was made to organize these vacated lands into Community Pastures. The Act was further amended in 1939 to remove the restriction as to time.

The approach to these problems has resulted in appreciable improvements in prairie agriculture in the last fifteen years, especially as regards the control of soil drifting, better utilization of land, and the conservation of water for farm purposes.

This annual report brings all information up to date on the activities undertaken to the end of the fiscal year ending March 31, 1952.

. . . . .

## ORGANIZATION AND ADMINISTRATION

The activities of P. F. R. A. are divided under two main headings as follows:

- (1) Land Utilization - It is a program designed to make the best use of prairie land in relation to rainfall and productivity. Land low in productivity in terms of wheat production is withdrawn from cultivation and returned to a grass cover for pasture purposes. This involves an active resettlement program of farmers from submarginal areas, establishing irrigation projects on to which these farmers can be moved, a country-wide regrassing program on abandoned farm land and the establishment of community pastures as permanent grazing areas. In all this the Land Utilization Branch is actively engaged. It is conducted in co-operation and on agreement with the Provincial Government authorities concerned.
- (2) Water Conservation - This is a program designed to facilitate the maximum use of Western Canada's water resources in order to minimize the problems of drought. Advisory, engineering and financial assistance is supplied to farmers to build effective water storage works on their farms or to organize groups of farmers to build larger community schemes on the more prominent prairie watersheds.



## LAND UTILIZATION

The P. F. R. A. Land Utilization Branch deals with problems of Resettlement and Community Pasture Development in drouth areas of the prairies.

The objective is to improve on the use made of land in drouth areas and is co-ordinated with water conservation and development activities of P. F. R. A.

### RESETTLEMENT

The resettlement and rehabilitation of people in drouth areas on lands unsuited for crop production is a main feature of P. F. R. A.

Assistance is given farmers to re-locate elsewhere on better quality lands and to re-establish themselves on a more economic basis.



Irrigation has been practiced on the Val Marie Irrigation project for thirteen years. A well established community has resulted with a sound livestock economy. Ref. No. P/2136.

This has been done in different ways. In many instances provincial crown lands have been given to farmers in exchange for their holdings. The abandoned land is transferred to P. F. R. A. for pasture purposes. It is desirable in such cases to locate the farmer as close to the pasture as possible so that he may receive grazing privileges. Blocks of irrigated land have been developed by P. F. R. A. throughout the drouth area for purposes of resettlement, to assure feed supply for livestock, and stabilize agricultural production in the area generally.

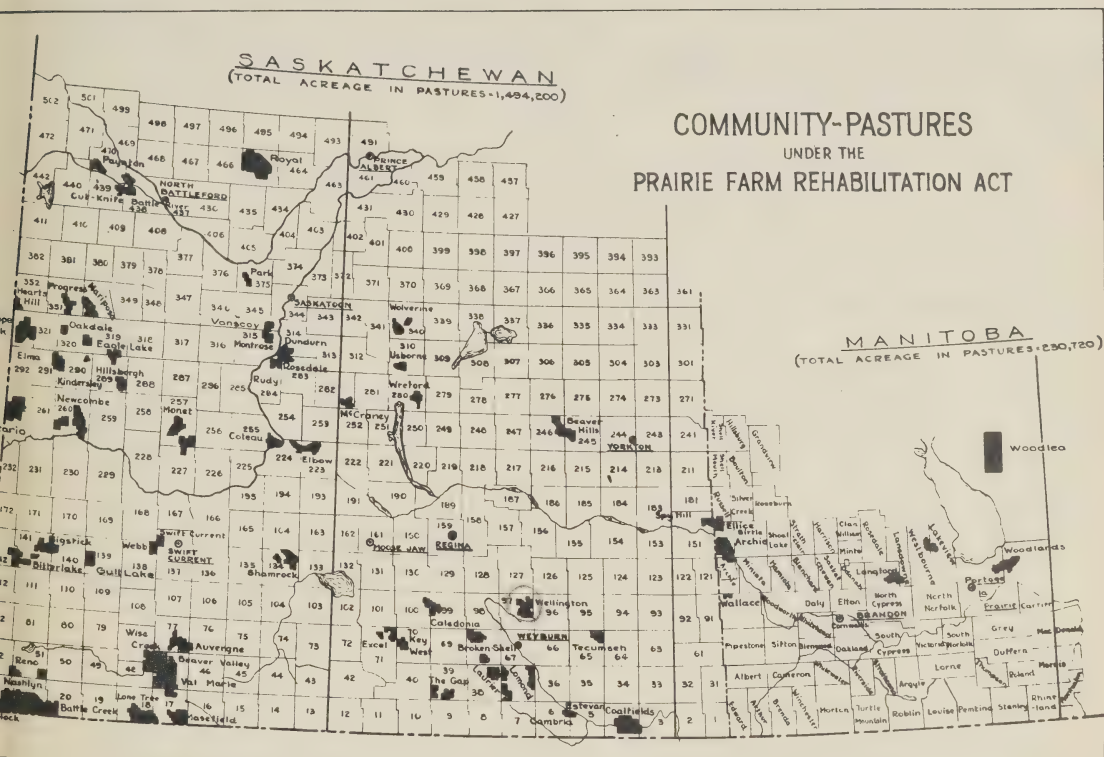
P. F. R. A. provides both engineering and financial assistance to farmers to build works that will conserve water for irrigation purposes. The following is a table showing the number of farm families that have benefitted from irrigation development on the prairies either through resettlement or by providing a greater security and stability in farm production.

Table 1  
Irrigation Development and Resettlement

<u>Name of Project</u>	<u>No. of Farmers Rehabilitated on Irrigation Projects</u>	<u>Total</u>
<u>South Cypress</u>		
Val Marie	90	
Eastend	55	
Richardson & McKinnon	27	
Small Units	39	211
<u>North Cypress</u>		
Maple Creek	135	
Swift Current	200	335
<u>Rolling Hills, Alberta</u>		
Rolling Hills	136	136
<u>Other Organized Projects</u>		
Saskatchewan	955	
Alberta	823	
Manitoba	27	1,805
<u>Small Individual Projects</u>		
20-200 acres each	2,718	2,718
	Total	<u>5,205</u>

## COMMUNITY PASTURE PROGRAM

The fundamental principle underlying community pasture work is to improve on the use made of land unsuited to crop production on the prairies. Lands susceptible to drifting, rough and stony, located in a low rainfall area, or for other reasons made unsuitable for crop production, are regrassed and otherwise improved for livestock production.



Map of Community Pastures in Manitoba and Saskatchewan.

A total of 57 operating pasture units have now been established in Saskatchewan and Manitoba enclosing 1,590,200 acres of land. 165,000 acres of the pasture land have been reseeded to grass and 862 stockwatering sites have been built to ensure water supply. The entire area has been improved for grazing purposes through proper management. Finally, every facility is provided in the pasture so that it may be operated efficiently and economically.

The following is a resume of activities in 1951.

### Pasture Operations

Successful operations can be reported on all pastures for the 1951 grazing season. An excellent carry-over of grass was obtained. Above average rainfall during the season left the majority of watering dams and dugouts full. More livestock were pastured on P. F. R. A. pastures in 1951 than in any previous year, the number totaling 77,240.



Operations will commence on two new units, Mantario #262 and Antelope Park #322, the spring of 1952. The construction of these two pastures is not completed but the demand is great for pasturage in these areas. Organizational meetings were held in the fall and a local Advisory Committee has been appointed.

## Pasture Services

Pasturage is allocated by the pasture committee on the basis of need. The following are the charges made by P. F. R. A. for pasture services.

Table 2

### Schedule of Community Pasture Rates

1951-52

#### Grazing Rates:

Cattle per month	-	\$ .75	
Horses per month	-	1.00	
Sheep per month	-	.07	
Cows (breeding service)	-	3.00	
Colts born in pasture, flat rate	-	3.00	up to and including November 30, of current year.
Calves born in pasture, flat rate	-	2.00	up to and including November 30, of current year.

N. B. A minimum grazing charge equivalent to three months fees will be levied against any animal recorded for pasturage.

#### Rates for Vaccine and Sundry Services:

Encephalomyelitis	-	.75 per double dose
Blackleg, Hemorrhagic Septicemia and Mixed Vaccine	-	.15 per single dose
Dehorning	-	.50 per head

Table 2 (cont'd)

Warble and Horn Fly Spraying. (Treatment at Corral)	- <del>.50</del> per head
Mineral Supplement	- .35 per head
Castration	
Cattle under 6 months	- 1.00 per head
Cattle 6 months or over	- 2.00 per head

It will be noted that grazing rates have been revised from 1950-51 standards. These new rates became effective August 1, 1951 and were the result of increased costs of pasture operations. Other services provided such as warble and insect control, inoculation of cattle against disease, dehorning, castration, branding, ear-tagging and salt supply are provided at cost.

Haying - Approximately 3,000 tons of hay were harvested on community pastures in 1951. This hay will be used for pasture requirements, feeding of bulls, etc., and the balance will be carried over as a feed reserve.

Grass Seed Harvested 1951-52 - Grass seed obtained from harvest operations on community pastures in 1951 totalled 94,900 pounds. Reno #51 pasture 25,620 pounds, Lone Tree #18 pasture 88,730 pounds, and McCraney #282 pasture 8,790 pounds.

26,100 pounds of crested wheat grass seed were distributed to various pastures after harvest for reseeding purposes that fall. The remainder will be used by P. F. R. A. for regressing purposes.

#### Pasture Construction

149 1/4 miles of standard fence were built this year enclosing an additional 59,120 acres in pasture.

Building of new pasture units and extensions to old established pastures took place as follows:

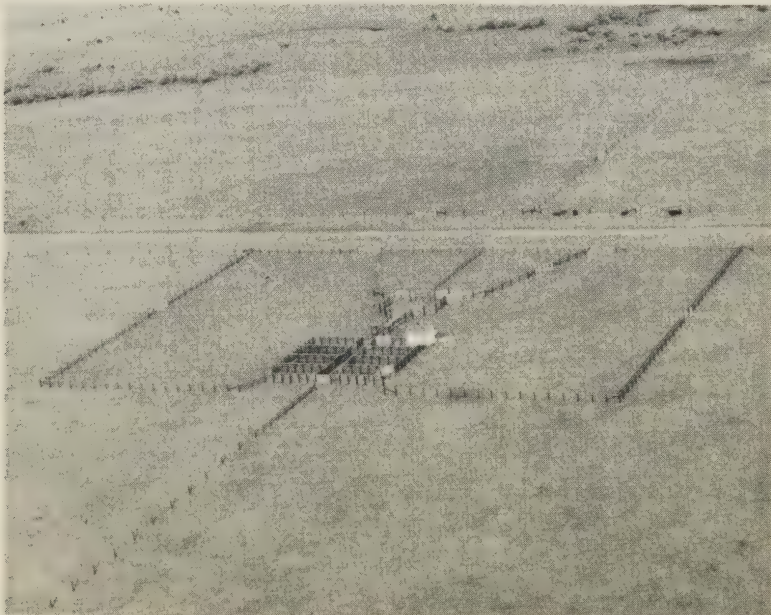
#### Acres Enclosed in New Pastures Under Construction:

Royal Pasture	11,680 acres
Mantario Pasture	21,600 acres
Antelope Pasture	26,240 acres

Acres Enclosed in Extensions to Established Pastures:

Coalfields Pasture	6,560 acres
Progress Pasture	480 acres
Key West Pasture	320 acres
Caledonia-Elmsthorpe Pasture	320 acres
Masefield Pasture	480 acres
Wellington Pasture	960 acres
Rudy Pasture	320 acres
Dundurn Pasture	160 acres

New headquarter residences were completed during 1951 in Coalfields #4, McCraney #282, and Westbourne pastures. The headquarter residence in Caledonia-Elmsthorpe #99-100 was moved, remodelled and completely rebuilt. In addition, fifty-two other necessary buildings were erected, remodelled or rebuilt, including residences, barns, garages, workshops, granaries, chicken houses and office shelters.



An aerial view of a typical P. F. R. A. community pasture corral. The design has been perfected to allow for the greatest efficiency in the handling of stock. Ref. No. P/725.



There were twelve new corrals built and three others under construction during the year and considerable repair work was undertaken of old and worn out structures. The construction work was handled by fourteen 6-25 men crews operating from camps in the field.

### Pasture Improvement Program

Lands enclosed in community pastures, designated as unsuited to crop production and composed of abandoned farm land and over-grazed pasture land, are regrassed and otherwise improved for pasture purposes.

A program of regrassing, water development, and control grazing and management practices have been the three phases of activity responsible for improved grazing conditions on pastures.

The following is a review of the pasture improvement work carried out on community pastures during the fiscal year.

Regrassing - Some 5,000 acres of pasture land in community pastures were seeded to crested wheat grass in 1951.

This was the first year for seeding Russian wild ryegrass in community pastures for improvement purposes. 220 acres of land were seeded to this grass in Antelope Park #322, Eagle Lake #289-319, and Masefield #17 pastures during the



Over one and one-half million acres of abandoned farm land and overgrazed pasture land have been reclaimed for pasture purposes in P. F. R. A. community pastures by reseeding to grass. The above picture illustrates abandoned farm land that has been reclaimed by seeding to crested wheat grass.  
Ref. No. P/1754.

year. Experimental seedings of Russian wild ryegrass were also made on 45 acres of land in Royal #465 pasture and 30 acres of land in Ellice-Archie pasture. Characterized by its shorter dormant season during summer months, the grass is being tried out in the hopes that it can be used effectively as grass for summer pasturage. Crested wheat grass is valued for its spring and early summer grazing qualities.

Excellent stands of crested wheat grass were obtained on the 11,630 acres of community pasture land seeded in 1950. Favourable moisture conditions during the year helped to germinate the seed and establish the stand. Cases were reported where crested wheat grass, seeded in the fall of 1950, headed out the following summer.

An estimated 165,000 acres of abandoned farm land have now been reclaimed to grass by reseedling in community pastures.

Water Development - Improvements to and the development of stockwatering facilities in community pastures were undertaken in 32 pastures during the summer season. This included the construction, repair and fencing of small dams and dugouts, the erection and repair of windmills, the digging of new wells, and the development of springs. 24 new dugouts, 4 stockwatering dams and 10 wells were built this year. This brings the total of stockwatering dams, dugouts, wells and springs developed by P. F. R. A. in community pastures to 862.

Controlled Grazing and Management Practices - To prevent the possibility of overgrazing pasture lands during periods of recurring drouth, P. F. R. A. maintains supervision over the carrying capacity of pastures. Definite policies of controlled grazing and grass management are followed to ensure against overgrazing and to make the greatest use of the grazing that is available.

Through the medium of scientific study and survey much valuable data, as to grass cover and yields of native and cultivated grasses during different seasons of the year, has been gathered and is applied on P. F. R. A. pastures. Grazing rotations with native and cultivated grasses are used in accordance with the growing and yielding ability of plants. A definite amount of grass carry-over from one grazing season to the next is maintained. The findings of survey and investigation are also applied when determining the proper location for stockwatering sites and deciding on what areas should be regressed and what grasses should be used.

Improvements in grass management and controlled grazing policies have doubled the carrying capacities of P. F. R. A. pastures since the inception of the program. Survey specialists from the Dominion Experimental Station at Swift Current are constantly studying new ways for improving grazing conditions and trying out new species of grass more adapted to pasture conditions. A resurvey of ten pastures in southwestern Saskatchewan was undertaken in 1951.

#### Flood Irrigation Schemes

On Reno #1 pasture 600 acres of low-lying land has been developed and fenced for flood irrigation purposes. Most of this area has been seeded to a grass-legume mixture for feed production.

A 400-acre flood scheme is located on the Battle Creek #20 pasture. Part of the area has been seeded to a grass-legume mixture, the balance was seeded to oats which produced 30-40 tons of green feed in 1951.

There are also flooding possibilities on the Govenlock #22, Nashlyn #21, Lone Tree #18, Masfield #17 and Auvergne-Wise Creek #76-77 pastures that will be developed when funds and equipment are available.

#### New Trends in Livestock Production on P. F. R. A. Pastures

The Beaver Hills #245-6 pasture handles 3,200 head of stock annually for some 300 neighboring small farm operators.

Practically all of these settlers adjoining the pasture area own and milk dairy cattle and sell cream. It is estimated that there are approximately eight milk cows per farm in the district. Monetary return to farmers from milk and cream is considered essential to their farming enterprise.

Grazing privileges are given farmers for their dairy herds in the Beaver Hills pasture to fill their pasture requirements. The pasture's construction and operation has been modified to suit this need. In the summer season approximately 900 milk cows are entered into the pasture after milking each morning and returned home for milking each evening.



Roundup activities on the P. F. R. A. Woodlands community pasture near Poplar Point, Manitoba. Holstein dairy cattle, it will be noted, are among those that are given grazing privileges on this pasture. Ref. No. P/2333.



There are a large number of dairy cattle grazed on Manitoba pastures, especially in the Woodlands and Portage pastures. These dairy cattle, however, are mostly dry cows and young cattle. These two pastures handle approximately 3,500 head of cattle annually with an estimated 65 per cent of this number being dairy type cattle. Holstein is the predominant breed.

#### Livestock Losses and Insurance

Patrons are encouraged by P. F. R. A. to take out insurance against possible livestock losses in pastures caused from sickness, disease, injury or for other miscellaneous reasons.

33 of the 57 pastures operating during the 1951 season carried insurance covering 44,176 head of livestock. Total losses amounted to 242 head or two-thirds of one per cent of the total number of livestock pastured. 209 head were eligible for insurance.

Mutual and Line Company Insurance are the two kinds of indemnity insurance schemes carried by patrons. 16 pastures carried Mutual Insurance. 17 pastures carried Line Company Insurance, the choice being dependent upon the local requirements of the individual pasture. A total of \$25,358.80 was collected in insurance premiums. Payments on indemnity amounted to \$20,492.34.

APPENDIX I  
Cumulative Statement

Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act

1938 to March 31st, 1952

Fiscal Year	No. of Pasture Units in Operation	Area of Pastures in Operation (acres)	Total Cost of Construction of Pastures in Operation	Livestock Units Carried on Pastures x	Acres per Unit of Livestock	Cost of Operation		Net Operating Cost per Unit of Livestock	Average Charge per Unit Livestock to Farmers
						Revenue	Operating Costs		
			\$			\$	\$	\$	\$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
						2,038,868.51	1,668,397.40		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.

- A pasture unit may include one or more pastures, but operated under one management. There are 88 separate pastures in operation.

## APPENDIX II

P. F. R. A. Community Pastures in Operation during the Fiscal Year ended March 31, 1952

Community Pasture and Headquarters	Area of Pasture (acres)	Cost of Construction \$	Stock Pastured Cattle Horses
Pasture Operating Units - Saskatchewan			
Coalfields #4, North Portal	31,140	94,716.30	864 88
Estevan-Cambria #5 & 6, Estevan	6,720	14,143.95	400 43
Masefield #17, Orkney	32,440	80,548.21	993 72
Lone Tree #18, Bracken	32,482	63,110.46	1,217 131
Battle Creek #20, Arena	65,760	94,459.68	1,244 43
Nashlyn #21, Nashlyn	61,520	63,426.76	1,639 6
Govenlock #22, Govenlock	65,120	75,581.83	1,204 5
Lomond #37, pasture #1, Goodwater	22,560	33,424.58	1,399 146
Lomond #37, pasture #3, Maxim	18,720	61,059.55	1,259 29
Laurier #38, Lomond #2, Radville	37,120	82,385.19	2,444 126
The Gap #39, Hardy	12,000	38,825.62	770 62
Val Marie #47, Val Marie	155,160	214,067.91	2,340 5
Beaver Valley #47A, Beaver Valley	11,360	22,966.95	473 5
Reno #51, pasture #1, Robsart	16,160	31,004.33	690 15
Reno #51, pasture #2, Consul	10,480	20,704.39	656 7
Tecumseh #65, Forget	18,960	52,465.26	1,432 151
Brokenshell #68, pasture #1, Trossachs	20,800	38,687.77	852 63
Brokenshell #68, pasture #2, Clearfield	8,160	13,583.47	254 26
Excel-Key West #70-71, Ormiston	31,200	77,901.22	2,221 159
Auvergne-Wise Creek #76-77, Cadillac	40,480	101,589.73	2,529 30
Wellington #97, Tyvan	25,840	78,713.39	3,867 141
Caledonia-Elmsthorpe #99-100, Milestone	24,800	95,195.87	1,129 47
Shamrock #134, Shamrock	26,000	39,955.99	1,475 144
Swift Current-Webb #137-8, Beverley	18,400	67,660.84	1,498 288
Big Stick #141, Golden Prairie	18,880	38,619.17	974 2
Bitter Lake #142, Turnstall	33,760	66,914.60	1,331 33
Spy Hill #152, Welby	20,000	41,763.20	1,043 76
Elbow #223-224, Elbow	29,440	65,562.22	1,676 97
Beaver Hills #245-6, Parkerview	44,160	99,912.14	2,811 319
Coteau #255, Birsay	26,000	48,679.72	1,058 104
Monet #257, Elrose	46,360	96,453.84	1,793 70



Community Pasture and Headquarters	Area of Pasture (acres)	Cost of Construction \$	Stock Pastured Cattle	Horses
Totals (carried forward)	1,011,982	2,014,084.14	43,535	2,533
Newcombe #260, Glidden	53,280	108,681.51	1,613	163
Wreford #280, Hatfield	12,640	60,990.29	930	62
McCraney #282, Davidson	10,720	61,934.16	1,021	
Rudy-Rosedale #283-284, Broderick	19,360	69,561.33	1,252	79
Hillsburgh #289, Brock	13,760	39,598.16	541	34
Eagle Lake #289-319, Netherhill	18,000	39,218.26	594	40
Kindersley-Elma #290-291, Kindersley	21,880	103,096.74	1,492	120
Usborne #310, Venn	12,720	30,799.46	861	51
Dundurn #314, Dundurn	20,640	34,911.13	1,105	
Montrose #315, Donavon	20,480	46,645.94	954	
Oakdale #320, Beaufield	20,480	59,554.58	752	69
Wolverine #340, Plunkett	16,640	58,629.15	1,345	167
Mariposa #350, Kerrobert	27,500	80,923.83	1,591	108
Progress #351, Onward	19,800	51,122.77	1,179	52
Heart's Hill #352, Cactus Lake	15,160	28,094.31	1,070	64
Park #375, Langham	7,040	17,448.80	359	
Battle River-Cut Knife #438-439, Gallivan	31,320	67,264.89	850	88
Royal #465, Marcelin	36,600	29,943.70	881	36
Paynton #470, Paynton	23,040	67,074.23	960	75
Totals for Saskatchewan	1,413,042	3,069,577.38	62,885	3,741

Community Pasture and Headquarters	Area of Pasture (acres)	Cost of Construction		Stock Pastured	
		\$		Cattle	Horses
Totals for Saskatchewan (carried forward)	1, 413, 042	3, 069, 577. 38		62, 885	3, 741
Pasture Operating Units - Manitoba					
Archie Pasture - McAuley	42, 400	76, 315. 93		713	334
Ellice Pasture - Lazare	20, 320	27, 614. 80		1, 042	75
Portage Pasture - Poplar Point	14, 640	37, 292. 74		1, 738	38
Woodland Pasture - Poplar Point	20, 960	51, 043. 08		1, 856	243
Lakeview Pasture - Langruth	29, 280	70, 410. 40		2, 281	30
Westbourne Pasture - Gladstone	• 11, 520	35, 669. 34		1, 044	31
Langford Pasture - Neepawa	19, 200	58, 662. 43		1, 107	82
Wallace Pasture - Elkhorn	3, 280	(Operated by Wallace R. M.)			
Totals for Manitoba	161, 600	357, 008. 72		9, 781	833
GRAND TOTALS	1, 574, 642	3, 426, 586. 10		72, 666	4, 574

## WATER CONSERVATION A

### INDIVIDUAL AND COMMUNITY PROJECTS

P. F. R. A. provides engineering and financial assistance to farmers in the construction of water conservation works within the drought areas of the three Prairie Provinces as a rehabilitation measure. The amount of financial assistance awarded is dependent upon the type and size of the project contemplated. At all times the P. F. R. A. policy, with respect to assistance provided, is to help farmers to rehabilitate themselves.



Snow piled high on both sides of a coulee in the Cypress Hills, Saskatchewan. Accumulations of snow such as this are the main sources for irrigation water on P. F. R. A. built irrigation schemes in southwestern Saskatchewan. Runoff from melting snow in the spring finds its way down into stream channels where it is stored for irrigation and stockwatering purposes. Ref. No. P/2117.

During a 17-year period from 1935 to March 31, 1952, P. F. R. A. has assisted farmers on the prairies to construct 46,759 individual farm projects in the form of dugouts, small stockwatering dams and small irrigation projects, and to build 244 community-sized water storage reservoirs. The program has helped materially in assisting farmers to make the maximum use of the limited water resource at their disposal, to stabilize agricultural production and minimize effects of drought.



Activities of the water development branch of P. F. R. A. for the 1951-52 fiscal year are discussed under the separate headings of "Individual Farm Projects" and "Community Projects".



Sometimes it is advantageous to create artificial means for diversion of flood waters. In the Cypress Hills, canals have been built around the foot of major drainage basins to catch runoff and transport it into one large storage reservoir. The Davis Diversion Canal, as shown, has been cleared of snow in readiness for the expected thaw. Ref. No. P/2088.

### Individual Farm Projects

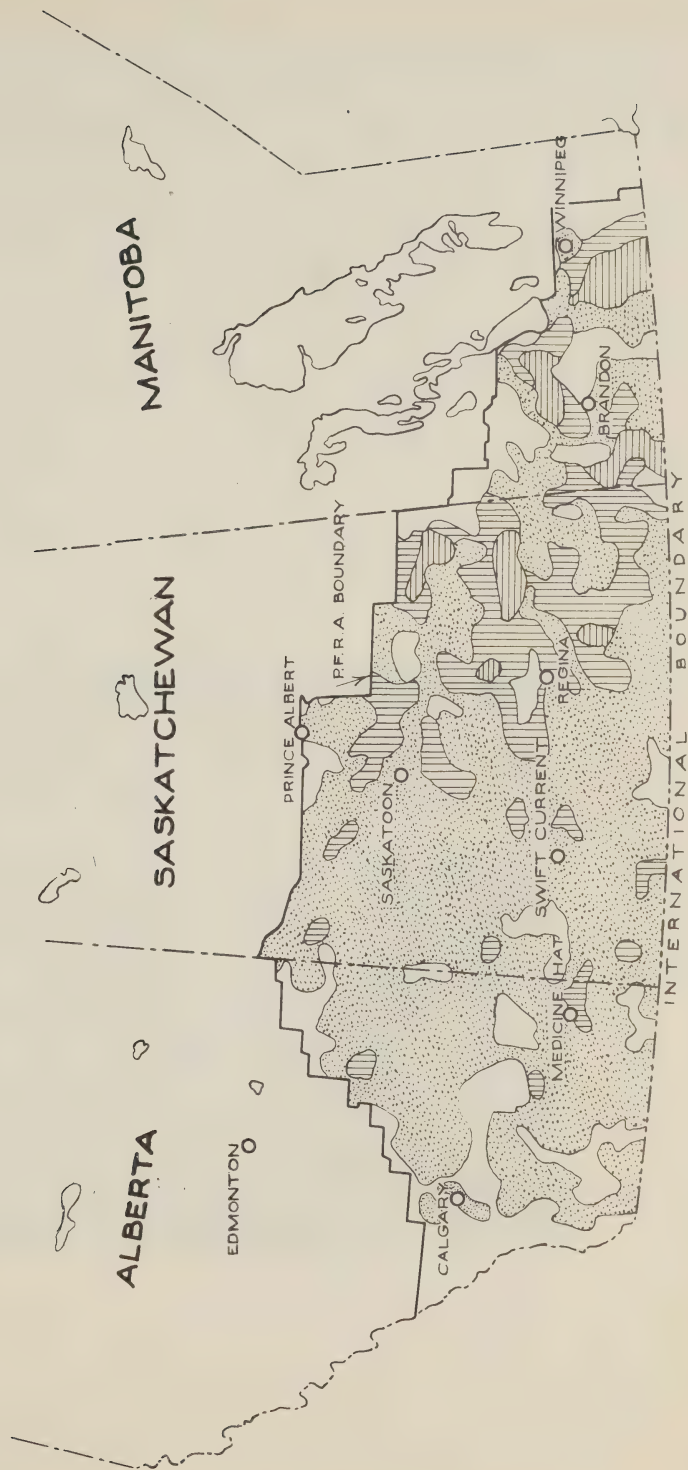
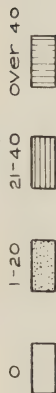
Individual farm projects are intended to meet the requirements of the individual farmer on the prairies in areas where water is normally scarce by catching and storing excess surface runoff water from melting snow in the spring. Inexpensive to build, they are usually in the form of dugouts or small dams constructed on local drainage basins. Engineering services are provided free of charge by P. F. R. A. to help in the planning of projects. Financial assistance is given on a per yardage of earth moved basis on completed projects. They may be adapted for a variety of uses depending upon the farmer's needs.

Engineering Services - The Water Development Branch carried out a heavy program during the year under the policy of the department in granting free engineering services. A total of 3,580 services were given.

# P.F.R.A.

SMALL WATER PROJECTS

Per Township





On Irrigation Projects

Miscellaneous reconnaissance surveys	1,104
Surveys for construction	811
Final certificates	232

On Stockwatering Dams

Miscellaneous reconnaissance surveys	842
Surveys for construction	399
Final certificates	192

TOTAL	<u>3,580</u>
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A heavy runoff on the North Cypress Watershed this year filled all the facilities on hand for storing water. Junction Reservoir, one of the several storage reservoirs on the Maple Creek Irrigation project in southwestern Saskatchewan, was filled the spring of 1951 for the first time in three years. Note the height of the water as indicated by the extent it has risen up the wall of the outlet control gate structure.  
Ref. No. P/2084.





A stockwatering dam built on a farm near the town of Hodgeville, Saskatchewan. Note the excellent rock rip-rap that has been placed on the upstream face of this dam to prevent damage from water action. Engineering and a limited amount of financial assistance is provided by P. F. R. A. to farmers who wish to build projects of this kind. Ref. No. P/2126.

Financial Assistance Provided - The construction of new individual farm projects during the 1951 season included 552 dugouts, 125 stockwatering dams, and 390 irrigation schemes. Their construction cost the farmer \$185,472.00 for dugouts, \$115,000.00 for stockwatering dams and \$743,340.00 for the construction of irrigation projects.

Toward these costs the department gave financial assistance at the rate of 4 1/2 cents per cubic yard of earth moved, plus the actual cost of materials in dams and irrigation works, to the following maximums for individual projects.

Dugout .....	\$125.00
Dam .....	\$150.00
Irrigation .....	\$350.00
Neighbour Project .....	\$500.00

New construction in 1951 brought the total number of projects upon which assistance has been paid since the inception of the Water Conservation Program to 38,416 dugouts, 5,928 dams, and 2,415 irrigation schemes. 9,360 acres of land can be irrigated by the 390 irrigation schemes built in 1951.



A flood irrigation scheme on Mr. Dyson's farm near the town of Shaunavon, Saskatchewan. Mr. Dyson irrigates approximately 160 acres of his land with dykes and is able to report excellent results. Ref. No. P/2091.

### Community Projects

The construction of community projects is confined largely to the more extensive drainage areas on the prairies and only in areas where sufficient water resources are available. Where groups of farmers organize a Water Users' Association or a Rural Municipality provides leadership in promoting an irrigation or water storage project, the P. F. R. A. co-operates with the local body. In such projects the usual procedure is for the Government of Canada to assume the capital cost of storage and connecting works and the local body to assume the responsibility for the distribution of water to the land or along the watershed.

In special cases, where the need for early returns to farmers proved imminent, P. F. R. A. has assisted further in the development of the irrigable land and has maintained a constant surveillance of the project's operations and progress. At times, also, agreement has been reached between P. F. R. A. and the provincial government concerned whereby the province assists with the development of the irrigable land.



Hay and forage are the main crops grown on the Val Marie Irrigation project. It is grown to meet livestock feed requirements for the winter period. Ref. No. P/1500.



Feeding cattle from a hay rack in the Cypress Hills. The hay is produced on irrigated land by the farmer. It supplements available feed supplies on pastures during winter months and in the early spring. Ref. No. P/2101.



In every instance the objective is to obtain effective control of all available water resources on prairie watersheds and to put the water to good use to benefit the farming community.

Development has taken place mainly on six of the more prominent prairie watersheds. For a resume of past activities in community water development, consult the 1949-50 and 1950-51 P. F. R. A. Annual Reports. Total development to March 31, 1952, amounts to 244 projects. Facilities provided can irrigate an estimated 328,758 acres of land.

Construction 1951-52 - 192 community projects received the attention of P. F. R. A. field engineers during the year. 20 projects were fully constructed and 10 more were partially completed. 46 were found feasible by survey and were recommended for construction. The remainder were found by survey to be unfeasible or were held for further study at the close of the season.



The Gouveneur Dam which is under construction near the town of Cadillac, Saskatchewan, on the Wood River Watershed. The project, begun in 1951, will be completed in 1952.  
Ref. No. P/2325.

The distribution of construction on a watershed basis is:

North Cypress Hills, Alberta	3
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Eaglehill Creek, Saskatchewan	8
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Wood River, Saskatchewan	1
Southwest Alberta	7
Poplar River, Saskatchewan	2
Qu'Appelle River, Saskatchewan	2
Miscellaneous	7

The classification of these community projects according to size and type is generally:

Reservoirs exceeding 100 acre-feet of storage	9
Reservoirs under 100 acre-feet of storage	13
Irrigation schemes	8

Maintenance, 1951-52 - A record snowfall in 1951 produced an unusually heavy runoff on the prairie watersheds which not only filled all storages but also overtaxed the outlet works and spillways of many projects.

Record snow fell in all regions. At Estevan, Saskatchewan, the recorded fall was over 70 inches; at Kindersley, Saskatchewan, it was nearly 30 inches, all other prairie localities had similar abnormal falls.

Numerous alterations, enlargements, and considerable maintenance were required. 75 projects required maintenance of a general nature; 18 spillways were rebuilt; 30 dams were raised and improved; and 11 outlet structures were enlarged or replaced.

Land Preparation and Irrigation Development - Progress was made in land preparation and irrigation development in the Swift Current and West Val Marie Irrigation Districts during the 1951-52 fiscal year.

The Swift Current Irrigation project is being built by sections. In order they are:

Swift Current-Waldeck Section . . . . .	2,000 acres irrigable
Rush Lake Section . . . . .	10,000 acres irrigable
Herbert-South Herbert Section . . . . .	8,000 acres irrigable
Neidpath-Hodgeville . . . . .	5,000 acres irrigable

The project area consists of a narrow strip of low lying land that extends from the city of Swift Current to the town of Herbert, a distance of approximately

40 miles. Water for irrigation is stored in two reservoirs, Duncairn Reservoir and Highfield Reservoir built by P. F. R. A. in 1942-43. As land is prepared for settlement it is turned over to the people. A total of 7,560 acres have been developed for irrigation to date.

Construction was continued in 1951 on the main supply canal which is being built by P. F. R. A. to bring water for irrigation to the Herbert section of the Swift Current project. This section of the main canal will be completed in 1952. The Saskatchewan Government is undertaking the construction of the water distribution in the Herbert area from the main canal which will bring an additional 6,000 acres of land under irrigation.

The West Val Marie Irrigation project is located 17 miles west of the town of Val Marie and in the centre of a vast area of community pasture land. It is being set up as a feed producing area for livestock as a means of stabilizing agricultural production in the area.



Land on the West Val Marie Irrigation project in southwestern Saskatchewan is being prepared for settlement. This aerial view takes in that part of the project already developed for irrigation. The area is supplied with water by gravity means. Settlers have been located on the project. Ref. No. P/2258.

Water is supplied from a main storage reservoir located in the Cypress Hills and is transported to the project by way of the Frenchman River. A supply reservoir for the project was built in 1939. The area was seeded to tame grasses and has been used extensively over the years for the production of livestock feed by growers in the surrounding districts.

Development of the area for irrigation began in 1948. 3,500 acres of land are irrigable. Approximately 1,100 acres of land have been developed for irrigation to date. The proposal is to divide the land into forty 90-acre units for purposes of settlement.

## WATER CONSERVATION B

### MAJOR WATER CONSERVATION AND DEVELOPMENT PROJECTS

P. F. R. A. undertakes the administration of Major Projects for the Government of Canada that involve large expenditures of money and may or may not be located within the P. F. R. A. area. These projects are sometimes referred to as Special Projects for which special grants of money are voted by Canada. Such undertakings are distinct from those which are financed wholly and directly from the annual P. F. R. A. appropriation.

#### PROJECTS UNDER CONSTRUCTION

##### St. Mary Irrigation Project

The Official Opening of the St. Mary Dam in southwestern Alberta on July 16, 1951 marked the culmination of many years of research and study into irrigation problems in Alberta.

The St. Mary Dam is the key structure in a project intended to bring water, when and where needed, to 500,000 acres of fertile land in southern Alberta. Now completed, the dam was started in 1946 and is a major step in a plan to control and effectively use all of Canada's share of four important international streams, the St. Mary, the Milk, the Belly and the Waterton rivers.

The occasion of the Official Opening marks the creation of a new and valuable asset to Canada in terms of prosperity for agriculture and for local industry, and in the security it will afford to farmers in the arid and semi-arid regions affected. The project will ensure water supply for an existing 120,000 acres of irrigated land near the city of Lethbridge and the town of Taber, and will extend irrigation development by 390,000 acres.

The opening marks the first time in the history of Canada that a major irrigation project has been undertaken with a federal authority, a provincial government and the farmer in partnership. The plan of approach used on this project has been generally accepted as the master plan for developing other major irrigation projects in Alberta and in Saskatchewan in the future.

According to the Dominion-Provincial Agreement, under which the new scheme is being constructed, the Government of Canada assumed the responsibility of obtaining, storing and making available for irrigation the necessary water. This involves all the construction necessary from the watersheds providing the irrigation waters, eastwards to and including the Ridge Reservoir, five miles south of the town of Raymond.

Also included in Government of Canada's share of the construction is the building of the St. Mary Dam, a dam almost as large across the Waterton River, the Pothole Coulee dam and many miles of connecting works from Waterton River Reservoir to the Ridge Reservoir.



The Alberta Government has assumed costs for all construction necessary eastwards from the Ridge Reservoir, as well as the responsibility for colonization and management. It means taking the water being made available by the Federal Government and making it available to farmers. It involves the construction of a network of hundreds of miles of canals and ditches, several reservoirs and a water distribution system to serve the additional 390,000 acres of dry land being brought under irrigation.



The main fill of the St. Mary Dam in southern Alberta as seen from downstream. The picture was taken June, 1951, at a time just after completion. Note the half-filled reservoir in the background. Ref. No. P/2192.

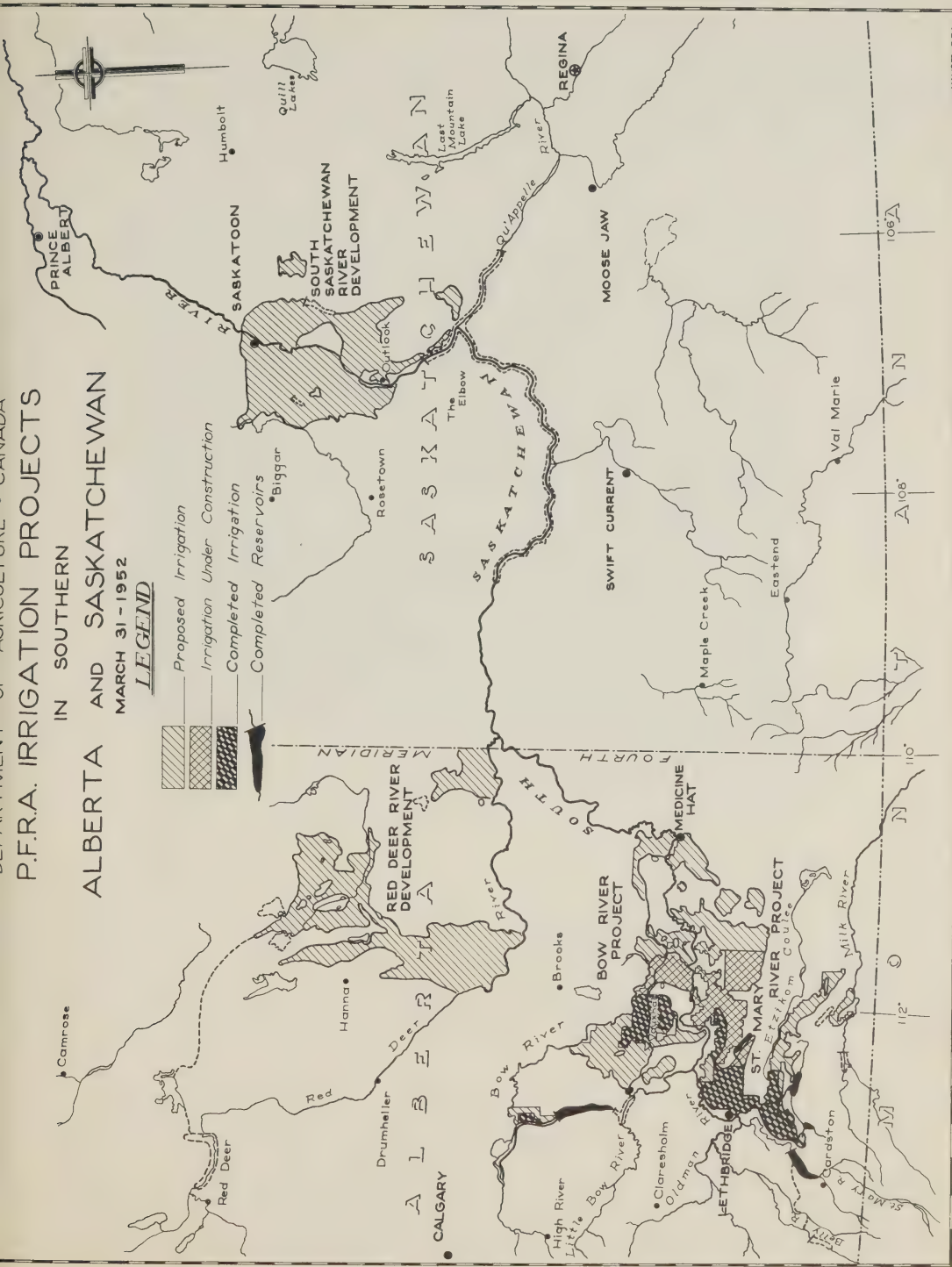
Approximately \$16,000,000 has now been spent in construction on the project--\$11,000,000 by the Government of Canada and \$5,000,000 by the Alberta Government. To date, the greatest emphasis in development has been given to the building of the St. Mary Dam and main canals. The program has now been cleared for more work on canal and distribution systems.

Activities for the 1951 construction season included completion of the concrete spillway, clean-up work around the site of the St. Mary Dam and a 50 mile extension to the main work section. 10,000 acres of land have been brought under the ditch by the Alberta Government. An additional 27,500 acres of land will be ready for irrigation in 1952. Colonization is progressing hand in hand with the development of the irrigable area.

MARCH 31-1952

LEGEND

- Proposed Irrigation
- Irrigation Under Construction
- Completed Irrigation
- Completed Reservoirs





The finished project will include, in addition to the St. Mary Dam and work completed on main canals and distribution system, the construction of eleven reservoirs, two main river diversions, connecting canals and a distribution system for 300,000 acres of land. The land for irrigation will extend for 160 miles across southern Alberta from the city of Lethbridge to the city of Medicine Hat.



The St. Mary spillway. Note the concrete bridge in the background crossing from the left side of the spillway to the main fill. Ref. No. P/2362.

#### Bow River Irrigation Project

This project was purchased by the Government of Canada, November, 1950, from a private British interest, the Canada Land and Irrigation Company. The project is now named the "Bow River Irrigation Project". The sale included the purchase of the entire project--the irrigation works and lands presently under irrigation and a tract of dry land of approximately 80,000 acres of which 45,000 acres can be irrigated.

The Company built the project in 1909 to 1912 to provide irrigation facilities to unsettled areas which it was then necessary to colonize with settlers. The Company was unable to fully complete the project.

The plan of the Federal Government is to provide new lands for the resettlement and rehabilitation of farmers from drouth areas by repairing and enlarging the system.



The irrigable area extends from approximately twenty-five miles west of Vauxhall from the Little Bow Reservoir, east to Medicine Hat. It is bounded on the south by the Oldman and South Saskatchewan rivers and on the north by the Bow River. The total irrigable land on the project amounts to 240,000 acres.

Water for irrigation is diverted from the Bow River at Arrowwood, 160 miles northwest of Vauxhall, and travels to the project by way of a system of canals and reservoirs. The old system supplied water to 57,000 acres of land. During the past year progress in the work to enlarge and strengthen this supply system that will carry water to an estimated 180,000 acres of land was reported. Survey and soil mechanics investigations along the line of the supply system from Arrowwood were given detailed study during the year.

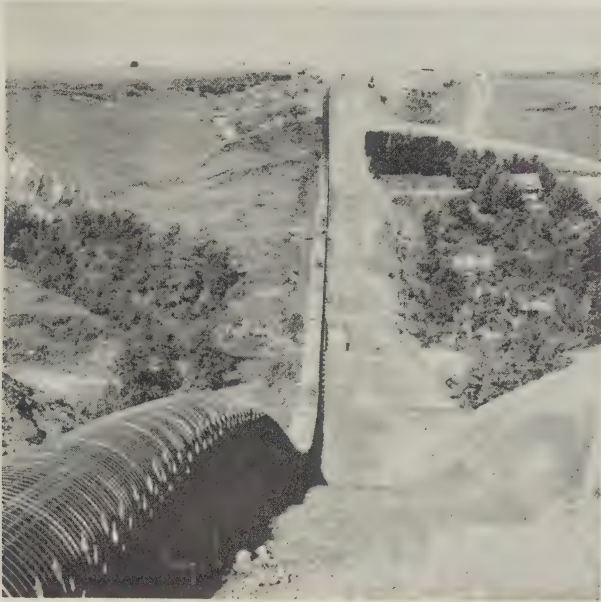


A feature of construction for the current year on the Bow River Irrigation project was the completion of the Big Cut. This cut was made in accordance with the plan to reconstruct and repair old and wornout structures along the course of the main Bow River water supply canal. Ref. No. P/2315.

Two major features of developing the irrigable area are being given attention.

The first consideration is the operation and maintenance of acreage already under irrigation which comprises 57,000 acres of land, some 450 separate farming units. P. F. R. A. plans to renovate, enlarge, renew and repair old canals and works to put the project in first class shape. P. F. R. A. also plans a complete drainage system for the project. Detailed drainage investigations were conducted on the project during the fiscal year.

Secondly, the project is being enlarged to provide additional lands for irrigation. When giving consideration to enlarging the system the project can be divided into three parts.



The East Arrowwood Syphon, across a deep coulee along the course of the main Bow River water supply canal, required considerable repair. Among other things, the foundations for the syphon needed raising and reinforcing to stand increased use. Ref. No. P/2314.

(a) Western Block. The Western Block is that area to the west of the presently irrigated area comprising some 70,000 acres and lying in the vicinity of Retlaw, Enchant and Lomond.

(b) Central Block. The Central Block comprises that area of land presently irrigated at Vauxhall plus the area acquired by Canada directly east and extending as far east as the Bow River Crossing at Ronalane. There are approximately 110,000 acres of irrigable land in this block.

(c) Eastern Block. This block comprises the land east of Ronalane and as far east as Medicine Hat. The irrigable areas are smaller and more scattered and make up an approximate area of 60,000 acres.

It is in connection with the enlargement of the project that the greatest amount of work becomes necessary and the greatest expenditures will be made. The Central Block will remain the responsibility of the Federal Government; the

Western Block will be developed by the Provincial Government; while the development of the Eastern Block is still a matter for negotiation.



In order to extend the irrigable area on the Bow River Irrigation project, it was necessary to pay considerable attention to the building of lateral water supply systems. One of these, somewhat of a new design, incorporates into one, a market road, an irrigation canal and a drainage canal. Ref. No. P/2308.

Development of the irrigable area is already taking place in the Central Block. In 1951 approximately 13,500 acres in the Hays District and Vauxhall, which are in the Central Block, were cultivated and the distribution system installed. Water can be supplied to the Hays District in 1952.

#### British Columbia Projects

The majority of these projects are being undertaken by P. F. R. A. at the request of the Veterans' Land Act Administration for the rehabilitation of veterans from World Wars I and II.

Development has taken place mainly at points along the extent of British Columbia's Okanagan and Thompson valleys. 6 projects have been built developing 2,591 acres of fertile land for irrigation. 210 war veterans have been rehabilitated by the Veterans' Land Act on these projects to date. Possibilities for further development are constantly being explored.



A brief description of each project, either under construction or completed during the fiscal year, and a short summary of activities, is given in the following pages.



New breaking on land of the Bow River Irrigation project in preparation for settlement. By far the greatest amount of breaking on the project during the year was done by means of blade type equipment. Approximately fifteen thousand acres of this prepared land will be supplied with water for irrigation in 1952 and will be allocated to over one hundred new settlers and their families. Ref. No. P/2310.

Bankhead Project - This project near Kelowna consists of 58 one-acre small holdings now settled by veterans under the Veterans' Land Act. The project was already served with water diverted by gravity means from Mill Creek near the city of Kelowna, British Columbia. The laterals, which were sufficient for the irrigation of large blocks of land, were found not large enough for such a large number of small holdings. Also, the system was in a poor state of repair.

Location surveys were made on this area in the summer of 1950 following a preliminary survey the previous year. It was found that the project could be rehabilitated and more adequately and efficiently served by pumping the water from nearby Mill Creek and by distributing it through a pressure pipe system for sprinkler irrigation.



Construction was begun early in 1951. It was completed in time for irrigation that same spring.



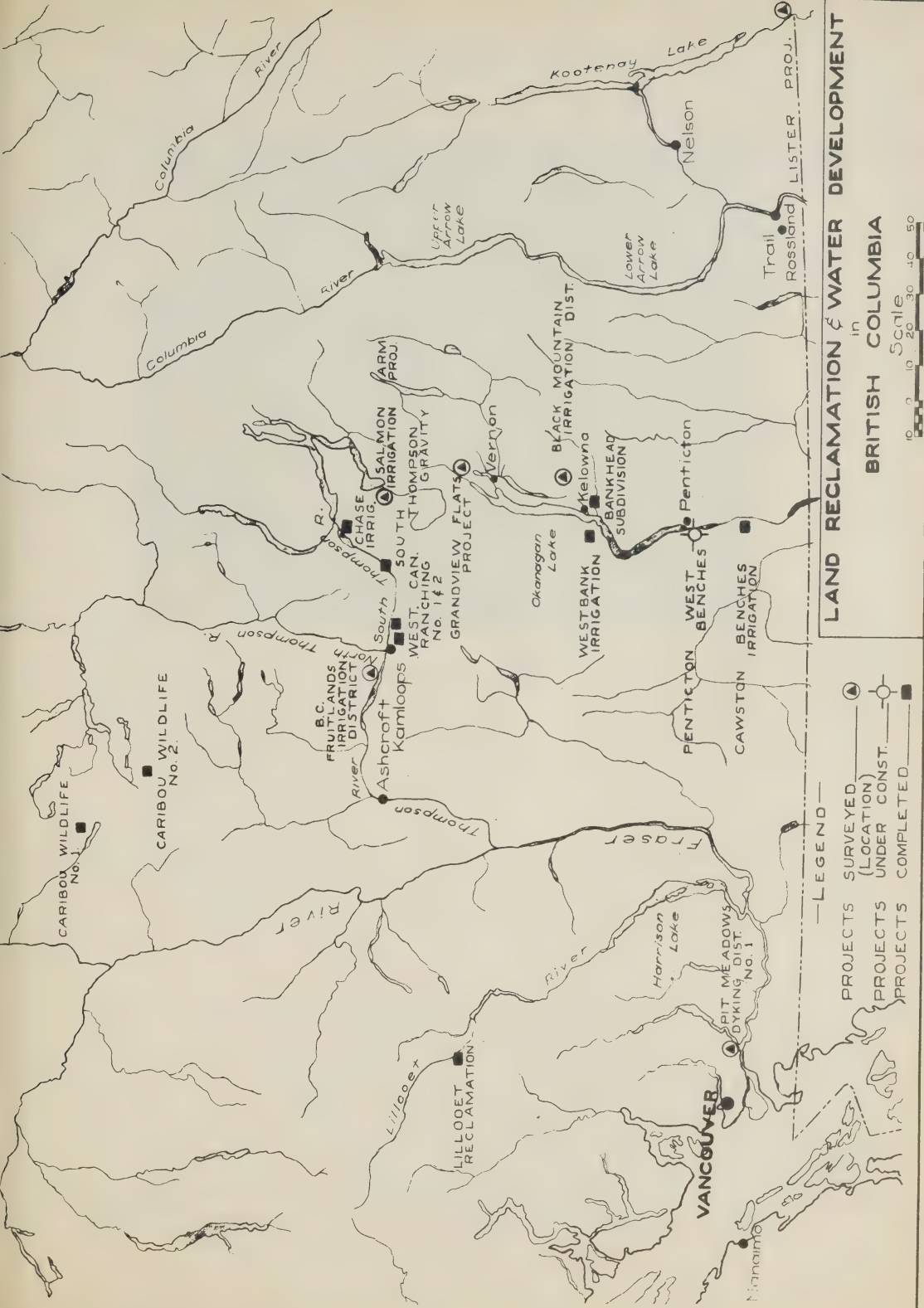
Veterans' Land Act homes built in accordance with their plan of small holdings for veterans on the Bankhead Sub-division project near Kelowna, British Columbia. Each veteran and his family receives a home and one acre of land which will be supplied with water by P. F. R. A. for irrigation purposes. Ref. No. P/1675.

A 20-horsepower pump at Mill Creek supplies water to the area through 1,500 feet of 10-inch wood stave pipe and is distributed by 8,125 feet of 3-inch to 8-inch wood stave pipe. The cost was borne partly by the settlers.

Chase Gravity Sprinkler Irrigation Project - The Chase project adjoins the townsite of Chase at the west on flats adjacent to the South Thompson River. The lands are entirely owned by Veterans' Land Act and 611.4 acres are irrigable. The area is subdivided into 30-acre full time farming units.

A request was made by Veterans' Land Act in January, 1951 for a study to determine the desirability of installing a sprinkler irrigation system on the project and so reduce water losses and excessive production costs.

During 1951 construction work was undertaken. Water is now brought into the area through 15,890 feet of 14-inch, 12-inch and 4-inch wood stave pipe. The project was completed and irrigation by sprinkler was carried out by those who had their sprinkler systems. 20 veterans of World War II will utilize the facilities provided by the new system.







General view of the irrigated land on the Chase project in British Columbia. The picture was taken looking north from an adjacent height of land. Approximately 700 acres have been developed for irrigation on the project for the settlement of World War II veterans. Development is based on a livestock type of economy. Ref. No. P/1676.

Lillooet Valley Reclamation Project - The Lillooet Valley Reclamation project is located one hundred miles northeast of Vancouver near the town of Pemberton on the Pacific Great Eastern Railway. In 1946, the start was made to reclaim the area from frequent flooding by constructing dykes and establishing proper drainage works. A possible 14,000 acres of land can be reclaimed in the area.

The area to be reclaimed consists of low lying land that extends for a distance of 27 miles along Lillooet River and tributaries north of the town of Pemberton. Agricultural development is hindered by flooding from the overflow of these streams during the spring months of the year. The plan is to increase the gradient on Lillooet River by lowering the level of Lillooet Lake, immediately below the development area. At the same time dykes are built along the river to prevent further flooding. Drainage is supplied to water-logged regions. The meander of streams across the floor of the valley is reduced as much as possible by building stream cutoffs and rock riprap is placed along banks to prevent any further tendency of the streams to erode and to carve new courses.



The main work on the project has now been completed. In the areas where improvement has been undertaken the land is protected. Additional protection from the Lillooet River has been achieved by lower gradients due to lowering the level of Lillooet Lake and straightening the river by means of cutoffs.



Frequent flooding of the Lillooet River in British Columbia has caused the inundation of thousands of acres of valuable agricultural land and made farming on many more thousands of acres precarious. Reclamation of these areas is being undertaken by P. F. R. A. for the Government of Canada. Note dyking along the banks of the Lillooet River to prevent flooding. Ref. No. P/269.

The program for the fiscal year 1951-52 was a continuation to the work of providing drainage and protection works in development areas numbers 2 and 3 on Lillooet River.

Intensive farming is being carried on in the area. During the past year no damage was caused by seepage or flood waters.

Westbank Project - This consists of 1,100 acres which lie directly across Okanagan Lake from Kelowna. The area is subdivided into 70, 12-acre lots and 55 smaller lots for small holdings. This area is now irrigated and is being settled by the Veterans' Land Act.

Construction was completed in 1950. The works consist of a diversion from Bear Creek by flume and ditch into Rose Valley where an earth fill dam creates a 2,100 acre feet storage reservoir, and a distribution system which conveys the water to each lot in a closed conduit steel pipe.

The system operated in 1951. Some project improvement and maintenance work was found necessary and the work was completed during the fiscal year.

Cawston Benches Project - This project consists of 624 acres on the north side of the Similkameen River five miles south of Keremeos. The area is subdivided in 57, 12-acre full-time farms. Irrigation is from a closed pipe pressure system for sprinkler irrigation.

Features of this project include a rock-filled crib dam at Otter Lake near Tulameen, to provide storage; a timber intake, deep well and pumphouse; and a wood-stave pipe distribution system. These structures were completed for operation by May, 1951. The installation of two 200 horsepower 2,000 g.p.m. vertical turbine pumps for irrigation and a 3 horsepower 25 g.p.m. domestic pump, was completed in time for the 1951 irrigation season.

Penticton West Benches Project - The Penticton West Benches project is located on 286 acres of bench land immediately west of the city of Penticton. The project is to be developed as a small holdings scheme for settlement of veterans under the Veterans' Land Act. Approximately 172 acres are to be developed, composed of about 97 small holdings averaging 1.6 acres in area. There are a considerable number of veterans who have full or part-time employment in the vicinity of Penticton, who require permanent quarters and a small farm unit to provide a portion of their income. Irrigation will be by pumping from the Okanagan Lake.

Location surveys were carried out on this project in the early part of 1950 on the basis of 3-acre subdivisions. The size for proposed subdivisions was later reduced to 1.6 acres. Further location surveys were necessary in 1951 to revise earlier estimates. Construction of the project began late in the fiscal year.

#### Riding Mountain Reclamation Project

Construction and general surveys were continued in the Riding and Duck Mountain watersheds during the 1951 season.

A more detailed description of the project is presented in the 1950-51 annual report. In brief, the problem is to remedy serious flood problems occurring on farm land surrounding a number of streams and rivers flowing off the north and east slopes of the two mountains.

Extensive investigations have been undertaken in the area at the request of the Manitoba Government to devise a plan to relieve the lands affected by flooding, amounting to over 252,000 acres.

The costs of reclamation in the area is borne jointly by the governments of Canada and Manitoba.

Construction work has been centered along Edwards and Mink creeks in the Riding Mountain area. The work mainly consists of clearing and dyking stream channels, straightening the alignment of channels by building stream cutoffs and diversions, and rebuilding municipal bridges. Construction work on Mink Creek was completed in 1951. Perhaps six weeks more work in cleaning up odd jobs still to be done on Edwards Creek, will complete the project.



The planting of tree cuttings on the sides of actively eroding stream channels has been found an effective means of stabilizing stream banks and encouraging re-disposition of water-deposited materials. Easily established and fast growing tree species are essential requirements in this work. By next year, the trees will be well established. Ref. No. P/2287.

Construction work in connection with stream bank erosion studies on the upper reaches of Edwards Creek was also completed during the fiscal year. In this work new methods of stabilizing stream banks against the scouring effect of flood waters and preventing erosion and silting problems are being undertaken.

Survey teams continued their investigations in the Riding Mountain area during 1951, preliminary to construction. Areas in which surveys were undertaken include Mink Creek, Ochre River, Kerosene Creek, Gilbert Plains, Dauphin and along the extent of the proposed Intermunicipal Drain between Dauphin and Ochre River.



## Assiniboine River Dykes

Previous to 1950, the Public Works Department of the Government of Canada assumed full responsibility for the construction and maintenance of a dyking system along both banks of the Assiniboine River east of Portage la Prairie, Manitoba.

In 1950 it was agreed that the responsibility for the above dyking system should be transferred from Public Works to Agriculture under P. F. R. A. During that year the construction of the so-called Hoop-n-Holler cutoff just east of Portage la Prairie was completed. This cutoff was completed late in November, 1950 and is now functioning satisfactorily.

## PROJECTS UNDER INVESTIGATION

### British Columbia Projects

Reconnaissance, preliminary and location surveys were carried out during the fiscal year 1951-52 as follows:

Reconnaissance Surveys - At the request of the Fraser River Basin Board, P. F. R. A. placed a survey party in the field this year to make reconnaissance surveys of land which could be irrigated by pumping from the Fraser, Thompson, South Thompson and North Thompson rivers.

These surveys were primarily to outline the areas physically so that further agronomy studies could be made, and to determine the power required for development.

Surveys show the following lands potentially irrigable.

	Fraser River, Williams Lake to Lytton (acres)	Thompson River (acres)	North Thompson River (acres)	South Thompson River (acres)	Total (acres)
Up to 50 foot head	339	7,210	26,034	8,329	41,912
Up to 100 foot head	843	9,251	29,549	11,407	51,050
Up to 150 foot head	1,199	11,167	31,808	13,582	57,756
Up to 200 foot head	1,627	12,613	33,549	14,283	62,072
Up to 250 foot head	2,233	13,956	35,169	15,535	66,893



Results of the surveys were placed on maps showing areas at 50-foot intervals above the rivers up to 250 feet, and incorporated into a report to the Fraser River Basin Board early in 1952.

Lister Project - This project is located southeast of Creston, British Columbia. It is bounded by Goat River on the north and west, mountains on the east, and the International Boundary to the south. 10,000 acres are potentially irrigable by pumping on this project.

Preliminary topographic surveys were made of the proposed reservoir site on Goat River and throughout the development area during 1951. cursory examination of soil mechanics problems were also undertaken around the site of the proposed dam.

Irrigation would allow mixed farming, built around stock-raising, especially dairy herds.

Grandview Flats Project - The Grandview Flats project is located about ten miles north of Vernon, on the Vernon-Kamloops Highway.

Preliminary survey data was found needed in order to properly report on the feasibility of development and to draw up cost estimates. The project is being sponsored by the Provincial Government. The proposal is to draw water for irrigation by pumping from Salmon River.

During the late fall of 1950 and during the early spring and summer of 1951, a party was in the field obtaining required topography and locating diversion lines.

Black Mountain Irrigation District - This project, receiving preliminary survey study, is to improve and extend the present supply works for the Black Mountain Irrigation District. The purpose is to ensure a water supply for 6,990 acres now under irrigation in the Black Mountain Irrigation District, Scotty Creek Irrigation District, Ellison Creek Irrigation District, and Glenmore Irrigation District, and to bring under irrigation 2,025 acres of new land.

P. F. R. A. survey parties have completed profile examination on main canals and have run a location line on a proposed new high level conveyance from Gopher Flats to Mill Creek, which bounds the project on the north.

In addition, soil mechanics investigations of three damsites for use as a balancing reservoir, and a storage reservoir on Fish Hawk Lake on the headwaters of Mission Creek, one of the sources of water supply to the project, were completed in 1951.

Agricultural recommendations and soil surveys have been made for the area. The whole project will now have to be studied relative to the engineering data obtained.

Salmon Arm Irrigation Project - The Salmon Arm Irrigation Project covers an irrigable area of 6,366 acres, all west of and adjacent to the town of Salmon Arm. It has been investigated by and reported on by the Province of British Columbia Water Rights Branch in reports dated 1931 and 1947. After studying the reports it was decided to conduct further field investigations to determine estimate preliminary costs of development.

Field work was completed in 1951. Soil surveys and agricultural recommendations are available. The project is now up for further consideration and study.

Pitt Meadows Dyking District No. 1 - This project lies east of Port Coquitlam. It is a dyking and drainage district bounded by the North and South Alouette Rivers. The acreage involved is 1,140 acres.

The district is at present seriously affected by seepage from the rivers. Farming has virtually been brought to a standstill. The land for the most part has reverted to the Crown and is being used as range.

P. F. R. A. , early in 1951, carried out surveys to ascertain costs of renovation of drainage works and reconstruction of dykes. A full report on preliminary survey has been prepared and submitted for consideration.

British Columbia Fruitlands Irrigation District - This project is an existing irrigation project built in 1900-1912. The project comprises some 3,000 acres of irrigable land lying south of Jamieson Creek along the North Thompson River and the area north of the Thompson River, to a point half way between Kamloops and Tranquille.

The British Columbia Government requested P. F. R. A. to conduct reconnaissance surveys on the project with a view to possible reconstruction and improvement.

Land utilization and soil surveys are to be carried out by the responsible departments of the Provincial Government to complete the investigations data.

Other Projects--Standing - These include projects in British Columbia proposed for development that have for one reason or another been left in abeyance for the time being. In a number of instances investigations have been conducted and reports on findings filed for future reference. Listed they are:

Cuisson Creek Project

South Okanagan Lands Project

Cariboo Wild Life Project

Midway--Rock Creek Project

Balfour Flats Project

North Creston Project

Goat River Project

North Thompson River Project

South Saskatchewan River Development Project

The South Saskatchewan River Development project, located in south central Saskatchewan, is a proposed multiple purpose project to be used for irrigation, power, urban water supply and recreation. The irrigable area, amounting to 500,000 acres, lies between the town of Elbow and the city of Saskatoon.

A full report on investigation into the possible development of the project was submitted to the Government of Canada in 1951. Further action in regards to development awaits the decision of a Royal Commission appointed to study the matter.

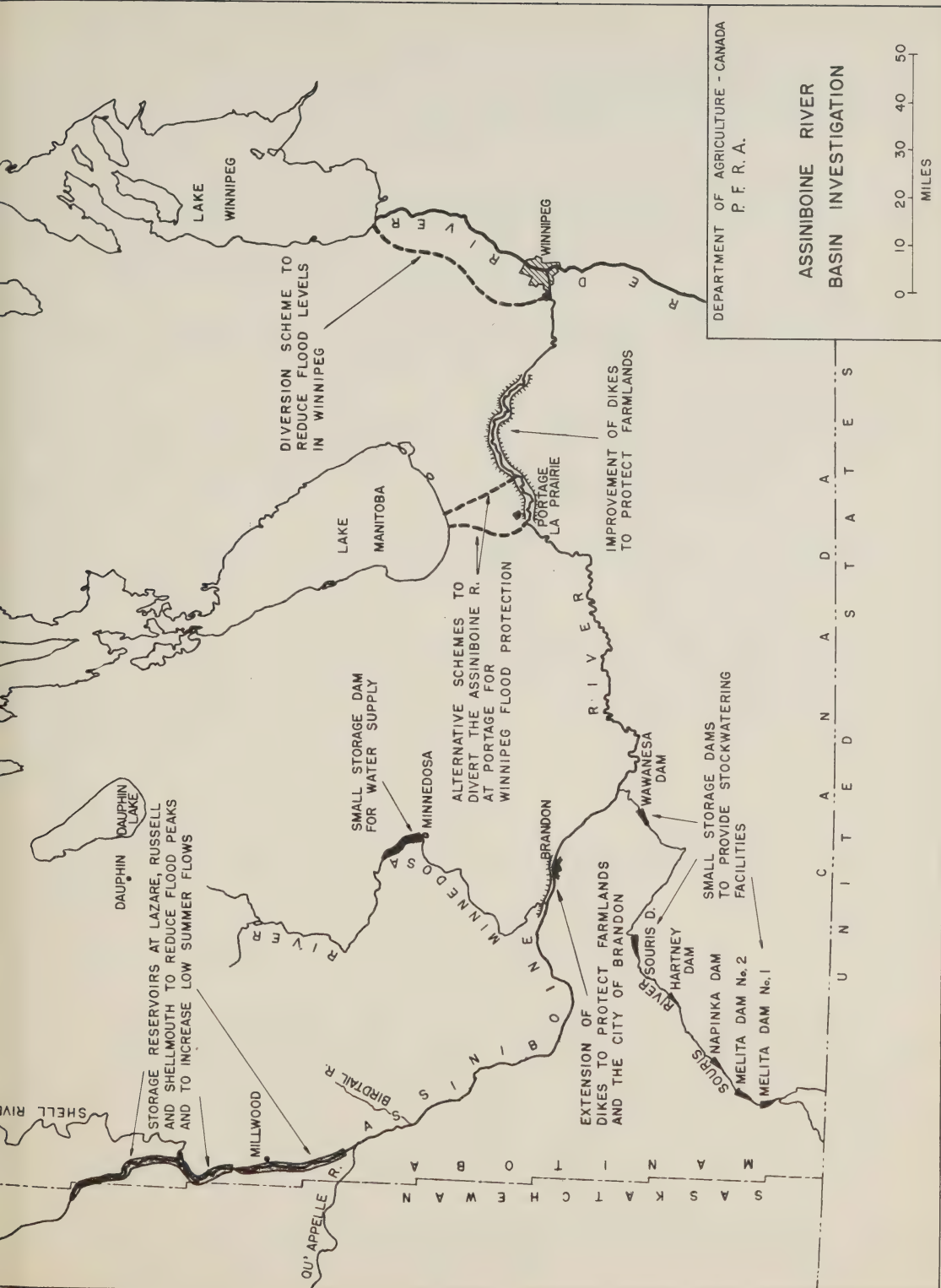
Assiniboine River Project

In the past, considerable damage has been caused by high floods in the valley of the Assiniboine River. The damaging effects of these repeated floods has been felt particularly in the area between Brandon and Virden and also between Portage la Prairie and Headingly where thousands of acres of valuable agricultural land and numerous farmsteads have repeatedly been inundated. In the year 1950 Winnipeg experienced one of the worst floods on record. This flood was caused by the Red River. Fortunately, in that year the flood peak of the Assiniboine River was below average, which prevented an even greater catastrophe to the city of Winnipeg.

As a result of the 1950 flood, P. F. R. A. was asked to make a complete investigation of the Assiniboine River and prepare a report and recommendations for remedial measures necessary for adequate flood control. This study is carried out in conjunction with the Red River Basin Investigation being undertaken by the Department of Resources and Development concerned with flood problems on the Red River south of Winnipeg.

A competent hydraulic engineer was engaged at the beginning of the year to take charge of the investigational office work in connection with this problem. The main purpose of the investigation is to devise plans and to estimate costs of structures and possible diversion works necessary for the prevention or relief from future floods in the Assiniboine River valley. Particular consideration is given to the flood problem in the city of Winnipeg. Secondary benefits, such as flow regulation, will also be taken into consideration.

Office Studies - Before any design for flood protection works can be undertaken it is necessary to solve certain related hydraulic problems. The drainage



DEPARTMENT OF AGRICULTURE - CANADA  
P. F. R. A.

**ASSINIBOINE RIVER  
BASIN INVESTIGATION**

0 10 20 30 40 50  
MILES

DAUPHIN LAKE

STORAGE RESERVOIRS AT LAZARE, RUSSELL  
AND SHELLMOUTH TO REDUCE FLOOD PEAKS  
AND TO INCREASE LOW SUMMER FLOWS

MILLWOOD

QU'APPELLE R.  
BIRDTAIL R.

SMALL STORAGE DAM  
FOR WATER SUPPLY

MINNECOTA

ALTERNATIVE SCHEMES TO  
DIVERT THE ASSINIBOINE R.  
AT PORTAGE FOR  
WINNIPEG FLOOD PROTECTION

BRANDON

EXTENSION OF  
DIKES TO PROTECT FARMLANDS  
AND THE CITY OF BRANDON

WAWANESA  
DAM

SOURIS D.  
HARTNEY DAM

SMALL STORAGE DAMS  
TO PROVIDE STOCKWATERING  
FACILITIES

MELITA DAM No. 1

MELITA DAM No. 2

ANAPINKA DAM

DIVERSION SCHEME TO  
REDUCE FLOOD LEVELS  
IN WINNIPEG

LAKE  
MANITOBA

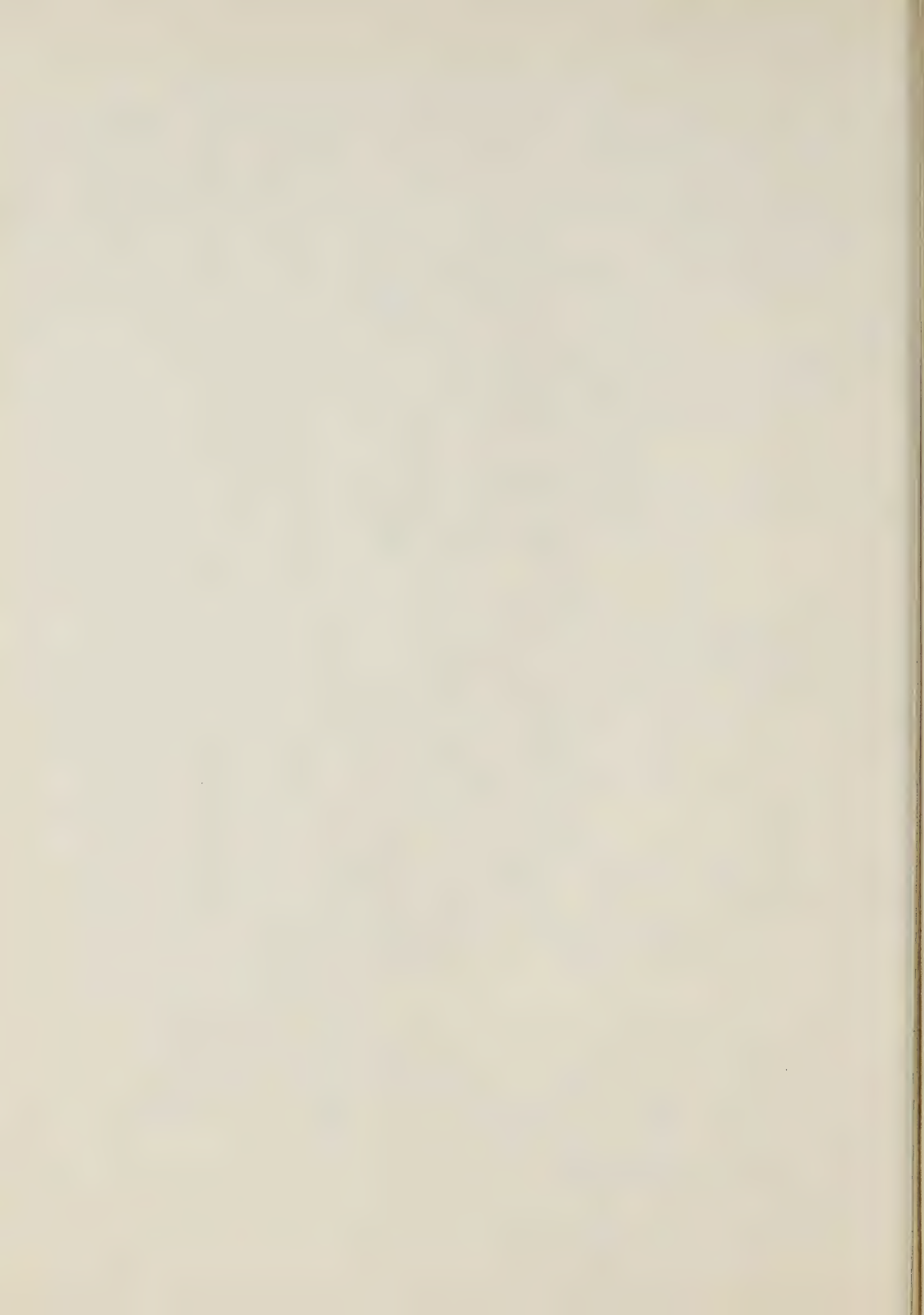
PORTAGE  
LA PRAIRIE

IMPROVEMENT OF DIKES  
TO PROTECT FARMLANDS

WINNIPEG

U N I T E D K I N G D O M  
C A N A D A  
S A S K A T C H E W A N  
M A N I T O B A





basin of the river and its tributaries must be carefully studied to evaluate the various factors which effect runoff. To obtain insight into these problems, an extensive hydraulic study of the Assiniboine River was undertaken and finished during the year.

After the completion of the hydraulic study of the river, detailed investigations were made of various remedial flood protection works.

Flood protection works studied included:

(a) A scheme to pump excess water from the Assiniboine River at flood periods and divert this flow by means of an artificial channel away to the Red River Delta.

(b) A study of a project consisting of a diversion dam on the Assiniboine River just west of Portage la Prairie and a diversion channel, to be used in times of flood to safeguard valuable farm lands east of Portage la Prairie. It would be of great benefit also to Winnipeg to relieve flood conditions in that city.

(c) Finally, a study of beneficial effects resulting from headwater storage on the Assiniboine River near St. Lazare, Russell and Shellmouth, was also carried out during the year.

Field surveys were conducted contiguous to studies being conducted in the office. A topographical survey was completed on the proposed diversion from the Assiniboine River near Portage la Prairie to Lake Manitoba. Also, gauging stations were installed on the Assiniboine River to gather the necessary hydraulic information necessary for the office studies.

#### Saskatchewan River Reclamation Project

Surveys and investigations undertaken in the area to determine the feasibility of development were pursuant to a request made to the Government of Canada by the governments of Manitoba and Saskatchewan.

A preliminary report on survey activities has been prepared and has been submitted to the Manitoba Government for consideration.

The land in question is bordered by the Saskatchewan, Carrot and Pasquia Rivers. The general elevation of this area is very little higher than the normal summer water level in the rivers. Spring floods overflow the river banks at many places and at times inundate practically all the section. Even ordinary summer floods from flash storms back water up drainage channels over the lower lying land.

Because of poor drainage and frequent flooding, only 16,000 acres of the 135,000 acres in the Pasquia area are used at present.

Surveys indicate the possibility of protecting the area from floods by a system of dykes and dams, and interior drainage provided by a system of drainage ditches.

If provided, this protection would allow all the land suitable for agriculture to be put into use, including 96,000 acres suitable for cultivation and 10,000 more suitable for grazing.

As new land in Manitoba and Saskatchewan becomes more and more difficult to obtain and demand for land increases, the possibilities of reclaiming such areas are given closer scrutiny.

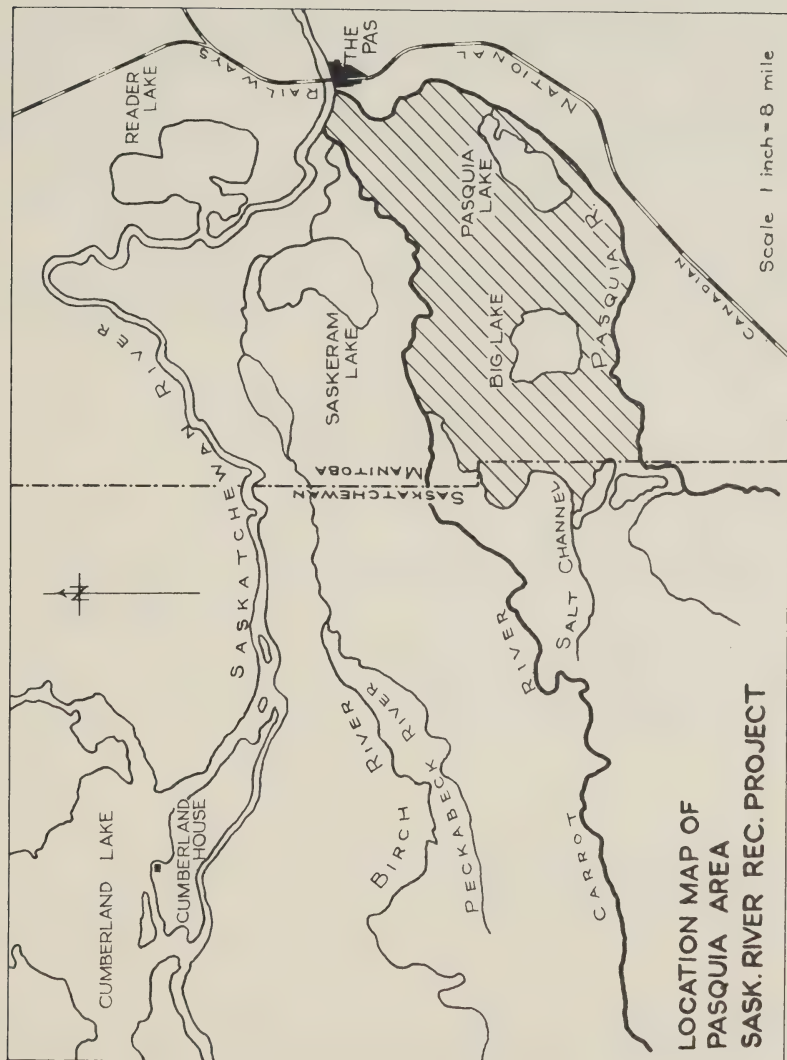
From the point of view of engineering, reclamation of the Pasquia area has three phases. These are:

1. Prevention of the overflow of the Carrot and Saskatchewan Rivers.
2. Handling of the Pasquia River.
3. Interior drainage.

To prevent overflow of the Carrot and Saskatchewan Rivers the method of control proposed is to construct a dyke to run along the south bank of the Saskatchewan River from the west bank of the Pasquia to the confluence of the Carrot and Saskatchewan; then along the south bank of the Carrot to the junction of Salt Channel with the Carrot, a distance of about 22 miles. The dyke would stand eight feet in height and have a minimum free board of three feet. The top width of the dyke would be ten feet and the side slopes 3:1.

To control the Pasquia River two plans have been brought forward. The first is to construct a dyke along the west and north bank of the Pasquia River. The second is to divert the river into Carrot River west of the Manitoba-Saskatchewan boundary. In either case the cost involved would be, it was estimated, approximately equal.

Interior drainage could be managed by dividing the section into four drainage units or polders (see map). No. 1 would drain into the Carrot River; No. 2 into the Pasquia River; and No. 3 and No. 4 into naturally occurring lakes. A certain amount of dredging work on the Pasquia River and the construction of two small dams on the outlets to the two lakes, would be necessary. Lateral drainage systems could be constructed in conjunction with the road system. Some pumping would be necessary during the first few years of operation.







## WATER CONSERVATION C

### ENGINEERING INVESTIGATIONAL SERVICES

For the successful development of any project, it is of fundamental importance that a complete groundwork of technical and other basic information be acquired before construction is undertaken.

So as not to duplicate the work of any service, when information is required P. F. R. A. solicits the assistance of existing services rather than undertake the work itself. Close co-operation is maintained between departments and branches of the Government of Canada and provincial departments.

Where services are not available to gather the information required P. F. R. A. provides its own facilities. In this connection four main divisions of engineering services are provided by P. F. R. A.

1. Design.
2. Survey-exploration.
3. Drainage.
4. Soil Mechanics.

Previous annual reports discuss in detail the functions of the various services as related to water conservation planning. Information dealing with the current activities of the various engineering services is discussed in this report under appropriate project headings.

In addition to the four main services mentioned above a number of special studies are being currently sponsored by P. F. R. A. to gather required information in water development. These studies are discussed under separate headings in the following:

#### Air-photography

The use of aerial photography and air photo interpretation is one of the newest sciences to be brought to the aid of engineers, agriculturists and geologists. It has a wide use in other fields too, but its use in P. F. R. A. has been limited mainly to the field of water conservation.

Incorporated with the P. F. R. A. Design Office, an aerial photograph library has been established. During the past year the P. F. R. A. aerial photograph library was increased to over 800 albums containing in excess of 150,000 individual photos. These give a coverage of about 75 per cent of the P. F. R. A. area. In addition, other special-project areas are also covered.

The aerial photograph library and interpretation service is one of growing importance and its use as a time and money saver in the location of construction

materials, the study of surface geology, soil classification work, delineation and study of drainage areas and determination of runoff characteristics, has been proven.

These facilities are at the disposal of all branches and departments of the P. F. R. A.

### Hydraulic Studies Using Model Tests

Model testing hydraulic design is becoming more and more recognized to supplement, corroborate, or modify designs of structures originated by the application of straight hydraulic theory.

In the past P. F. R. A. has had model tests on proposed structures conducted at the United States Waterways Experiment Station, Vicksburg, Mississippi and at the main laboratories of the National Research Council, Ottawa. A number of tests were made this year by P. F. R. A. design engineers at the Saskatchewan University laboratories. Model tests were made for the Souris River Dam and the outlet structure from Lake McGregor Reservoir on the Bow River project. In each case modifications of design were indicated resulting in a substantial saving in cost. Other model tests are planned for the future.

### Stream Bank Erosion Studies

Studies are being undertaken on a number of streams flowing off the northern and eastern slopes of the Riding Mountain and along certain sections of the Assiniboine River near the city of Brandon that have given rise to problems of bank erosion, sedimentation and flooding. These studies are being undertaken by P. F. R. A. at the request of the Manitoba Government to devise means of alleviating such conditions.

Various methods of stabilizing and preventing erosion on stream banks are being tried on an experimental basis. Final and certain conclusions from Stream Bank Erosion Studies are not expected to be available for a period of from eight to ten years hence. The variability of flood patterns alone is one of the major factors determining the period in which study must be continued.

### Prairie Provinces Water Board

The Prairie Provinces Water Board was established in 1948 on agreement between the governments of the Three Prairie Provinces and the Government of Canada.

Its purpose is to study and recommend the best use to be made of inter-provincial waters and recommend upon its allocation. Not wishing to duplicate the work of any other service the function of the Board is confined to co-ordinating, appraising, and interpreting the results of investigations that have been undertaken and does not conduct studies on its own.

According to the agreement P. F. R. A. assumes Canada's share of responsibility to the Board by providing the technical and clerical staff required to carry out the work. P. F. R. A. also provides all the necessary accommodation and equipment required as well as a portion of the total salary paid.

Along with its other duties, the staff assigned to the Board is presently engaged in studies on the Saskatchewan River Drainage Basin, a water supply and use study of the Qu'Appelle River Basin, and investigating the water supply situation of streams rising in the Cypress Hills. The purpose is to determine the potential water resources in these areas, the extent to which development has already taken place and recommend possibilities of further development.

#### Davin Hydraulogical Research Project

The Davin Hydraulogical Research Project embraces a five and one-half square mile area about 20 miles east southeast of Regina. The necessity of obtaining basic rainfall-runoff relationships on the prairies is essential in a program such as that sponsored by P. F. R. A. to develop Western Canada's available water resources. This project was therefore conceived by P. F. R. A. and is now being set up and operated by the Dominion Experimental Station at Swift Current. Financial backing is provided by the P. F. R. A.

The objectives in the study are to:

1. Assist in obtaining data on maximum probable intensity rates, duration and areal extent of rainfall.
2. Provide information on infiltration rates and ground moisture conditions in various small watersheds within the project area.
3. Provide a basis for estimating maximum runoff rates from any given summer rainstorm and from spring floods due to snowmelt.
4. Provide a basis for estimating total annual yields of water from similar areas for the purpose of allocating water rights and designing storage reservoirs.
5. Obtain information on soil erosion and such other purposes as the Experimental Farms Service might desire.
6. Summary: Small reservoirs and spillways have been and are still being designed on very rough and empirical basis; it is hoped that the snow-rainfall-runoff relationships obtained from this project will improve the situation.

On the project a runoff measuring weir and water-stage recorder were installed in the autumn of 1950. Two men from the Swift Current Experimental Station succeeded in obtaining a complete record of the spring runoff during 1951. During the summer of 1951, a complete meteorological station was established at Davin with the assistance of the Meteorological Division. And finally, six standard rain gauges and two automatic recording rain gauges were established at different points in the area.



Now that all the meteorological and hydraulical instruments are installed, a systematized program of data collection (by local observers) will be continued. Supervision and operation of the project will continue to be the responsibility of the Swift Current Experimental Station and also the analysis of field data. P. F. R. A. will continue to aid in the required financing of the project. P. F. R. A. engineers will assist and co-operate with the Experimental Station in the interpretation of data if required.

## PRAIRIE FARM REHABILITATION ACT

showing number of projects and amount of financial assistance paid since the inauguration of program to

March 31, 1952

Province & Classification	DUGOUTS		STOCKWATER DAMS		IRRIGATION SCHEMES		TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
<b>MANITOBA</b>								
Individual	9,497	928,601.81	290	21,064.40	51	13,732.05	9,838	963,398.26
Neigh. & Comm.	39	7,356.64	26	20,449.43	4	1,060.15	69	28,866.22
Total	9,536	935,958.45	316	41,513.83	55	14,792.20	9,907	992,264.48
<b>SASKATCHEWAN</b>								
Individual	25,760	2,852,261.70	3,628	305,215.47	1,546	346,130.76	30,934	3,503,607.93
Neigh. & Comm.	394	166,874.47	136	97,502.23	48	20,348.50	578	284,725.20
Total	26,154	3,019,136.17	3,764	402,717.70	1,594	366,479.26	31,512	3,788,333.13
<b>ALBERTA</b>								
Individual	2,773	286,162.73	1,847	167,017.84	829	187,485.21	5,449	640,665.78
Neigh. & Comm.	25	6,774.34	42	27,018.37	16	11,775.89	83	45,568.60
Total	2,798	292,937.07	1,889	194,036.21	845	199,261.10	5,532	686,234.38
GRAND TOTAL	38,488	4,248,031.69	5,969	638,267.74	2,494	580,532.56	46,951	5,466,831.99

# APPENDIX IV

## Progress by Years in the Construction of Small Projects P. F. R. A. Water Development Program 1935 to March 31, 1952.

Fiscal Year	Number of Projects Constructed				Financial Assistance Paid on Projects			
	(1) DO	SWD	Irr	Total	DO	SWD	Irr	Total
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	624	166	469	1,259	72,047.91	15,528.84	142,764.57	230,341.32
Total	38,488	5,969	2,494	46,951	4,248,031.69	638,267.74	580,532.56	5,466,831.99

WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS

To March 31, 1952.

MANITOBA

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Crystal City Storage	1	Crystal City	Stockwatering	1935	---	3	3,334.00
R. M. of Edwards	2	Melita	"	1935	---	100	10,214.00
Town of Souris	3	Souris	"	1935	---	150	3,841.00
Clear Water Storage	4	Clear Water	"	1938	---	12	5,949.00
Brandon Water Supply	5	Brandon	Storage	1940	---	500	3,996.00
Morris River-Rock Lake	6	Carman	Stockwatering	1940	---	10,000	23,401.00
Dead Horse Creek Dam	7	Morden	Irr. & Stockwatering	1941	100	1,200	49,891.00
La Salle River Dams	8	La Salle	Stockwatering	1941	---	900	22,989.00
Hartney	9	Hartney	Irr. & Stockwatering	1941)			(10,264.00
Melita	10	Melita	" "	1941)	3,900	3,200	(11,372.00
Napinka	11	Napinka	" "	1941)			( 6,770.00
Wawanesa	12	Wawanesa	" "	1941)			(15,457.00
Whitemud River Storage	13	Gladstone	Stockwatering	1943	---	660	11,464.00
Alexander Soil Conser- vation	14	Alexander	Soil Conservation	1944	---	---	5,250.00
Little Souris River Dam	15	Melita	Stockwatering	1945	---	250	1,380.00
Birtle Dam	16	Birtle	Stockwatering	1947	---	---	11,490.00
R. M. Westbourne	17	Gladstone	"	1947	---	---	5,993.00
Rosebank Dam	18	Rosebank	Stockwatering	1948	---	32	12,161.00
Shoal Lake Project	19	Shoal Lake	"	1948	---	3,500	8,491.00
St. Lazarre Storage Res.	20	Lazarre	"	1948	---	5	1,470.00
Brandon Flood Irr.	21	Brandon	Flood Irrigation	1949	1,000	---	27,107.00
Whitemud River	22	Woodside	Stockwatering	1949	---	160	6,506.00



Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Dead Lake Community Minnedosa Dam	23 24	Gladstone Minnedosa	Irr. & Stockwatering Storage	1950 1950	20 20	90 1,500	1,933.00 105,051.00
Wawanesa		Wawanesa	Irr. & Stockwatering	Incomplete	---	---	79,781.00
<u>SASKATCHEWAN</u>							
Adams Lake Lajord	1 2	Battle Creek Lajord	Irrigation Flood Control	1936 1936	1,500 ---	2,000 300	8,831.00 13,800.00
Val Marie Middle Creek Davidson	3 4 5	Val Marie Battle Creek Davidson	Irrigation " Irr. & Stockwatering	1937 1937 1937	5,500 1,000 100	7,000 20,000 277	214,558.00 18,663.00 3,114.00
Dunn & Watt Moose Mountain	6 7	Mankota Corning	Irrigation "	1937 1937	305 ---	---	2,996.00 14,829.00
Girvin Lac Pelletier	8 9	Girvin Lac Pelletier	Stockwatering "	1937 1937	---	19 3,350	2,180.00 2,139.00
McCraney, R. M. of Roughbark Creek	10 11	Kenaston Goodwater	" "	1937 1937	---	350 1,500	1,896.00 9,314.00
Maple Creek Moose Jaw Creek Lake of the Rivers Long Creek #1 Long Creek #2 Masfield Pipestone Lake	12 13 14 15 16 17 18	Maple Creek Lang Assiniboia Estevan Estevan Masfield Broadview	Irr. & Stockwatering Irrigation Stockwatering " " " "	1938 1938 1938 1938 1938 1938 1938	4,500 2,250 --- --- --- --- ---	23,260 2,180 300 137 90 40 1,600	356,179.00 7,618.00 10,805.00 8,729.00 8,701.00 3,187.00 11,785.00
Eastend Cypress Storage Big Arm Storage Kisbey Flats Arcola	19 20 21 22 23	Eastend Ravenscrag Liberty Kisbey Arcola	Irrigation Storage for Irrigation Irr. & Stockwatering Irrigation Stockwatering	1939 1939 1939 1939 1939	4,000 20,000 5,000 2,300 ---	1,300 80,000 5,200 5,000 Under-ground	161,682.00 467,691.00 13,161.00 23,211.00 17,310.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Val Marie West	24	Val Marie	Irrigation	1940	3,500	2,000	150,639.00
Lafleche	25	Lafleche	Stockwatering	1940	---	38	2,525.00
Saskatoon	26	Saskatoon	Storage	1940	---	1,200	290,446.00
Weyburn	27	Weyburn	Flood Irrigation	1940	---	4,000	51,311.00
Buffalo Pound	28	Qu'Appelle Valley	Irrigation	1940	*	---	83,723.00
Battleford	29	North Battleford	Irrigation (Pump)	1941	800	---	3,058.00
Dead Lake	30	Macoun	Irr. & Stockwatering	1941)	Souris River Development	---	(17,528.00
Oxbow	31	Oxbow	" " "	1941)	3,900	3,200	(17,436.00
Souris-Estevan	32	Estevan	" " "	1941)	---	---	(91,133.00
Canora	33	Canora	Storage	1941	---	300	16,128.00
Crooked & Round Lake	34	Qu'Appelle Valley	Irrigation	1941	*	---	48,650.00
Fairhill	35	" "	" "	1941	*	---	4,302.00
Lebret	36	" "	" "	1941	*	---	16,307.00
Last Mountain Lake	37	" "	" "	1941	*	---	42,271.00
Tantallon	38	Tantallon	Stockwatering	1942	---	---	2,790.00
Wood River Development	39	Coderre and Gravelbourg	" "	1942	---	4,923	33,738.00
Jackfish Creek	40	Meota	Stockwatering	1943	---	90	2,940.00
Craven Dam	41	Qu'Appelle Valley	Irrigation	1943	*	---	33,675.00
Echo Lake	42	" "	" "	1943	*	---	41,753.00
Caron Water Development	43	Thunder Creek	Stor. & Stockwatering	1944	---	43,500	701,433.00
Cadillac	44	Cadillac	Irr. & Stockwatering	1945	800	1,350	32,887.00
Wolverine Creek	45	Humboldt	Stockwatering	1945	---	522	52,600.00
Loon Creek	46	Markinch	" "	1945	---	700	7,180.00
Richardson-McKinnon	47	Consul	Irrigation	1946	3,000	---	53,913.00
Swift Current	48	Swift Current	Irr. & Stockwatering	1946	30,000	95,000	748,906.00
Beechy #1	49	Beechy	" " "	1946	600	1,000	12,746.00
Matador	50	Matador	" " "	1946	120	220	5,216.00
Bracken	51	Bracken	Stockwatering	1946	---	158	1,001.00

\* - Ultimate irrigation development for all projects along Qu'Appelle River Valley - 30,000. (Total storage capacity - 95,600 acre feet.)

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Eagle Hill Creek	52	Plenty	Stockwatering	1946	---	10,700	6,432.00
Hanley	53	Hanley	"	1946	---	60	3,797.00
Lucky Lake	54	Lucky Lake	"	1946	---	120	7,596.00
Frenchville	55	Frenchville	Irr. & Stockwatering	1947	430	670	8,096.00
Gravelbourg Storage	56	Gravelbourg	Irrigation	1947	500	---	1,917.00
Coronach	57	Coronach	Irr. & Stockwatering	1947	300	1,450	10,990.00
Wittrock	58	Frenchville	Irrigation	1947	520	---	3,884.00
Cedoux	59	Cedoux	Stockwatering	1947	---	314	4,999.00
Davin	60	Kronau	"	1947	---	1,080	13,501.00
Jumping Deer Creek	61	Lipton	"	1947	---	145	6,092.00
Kaposvar	62	Stockholm	"	1947	---	290	11,946.00
Kelfield	63	Kelfield	"	1947	---	25	4,927.00
Radville	64	Radville	"	1947	---	32	5,019.00
Shrimp Lake	65	Herschel	"	1947	---	450	9,367.00
Tyvan	66	Tyvan	"	1947	---	1,000	11,986.00
Wynyard	67	Wynyard	"	1947	---	35	6,225.00
Spangler Project	68	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Gravelbourg South	69	Gravelbourg	"	1948	600	1,500	8,186.00
Beechy #2	70	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Marsh Flood Irrigation	71	Cedoux	Irrigation	1948	400	---	1,765.00
Pike Lake	72	Vanscoy	Irr. & Stockwatering	1948	900	2,500	7,360.00
Rosedale	73	Hanley	Irrigation	1948	60	100	1,016.00
Sherwood	74	Regina	Dugout (Irrigation)	1948	20	3	697.00
Talmage	75	Cedoux	Irrigation	1948	1,600	---	3,483.00
Allan	76	Allan	Stockwatering	1948	---	300	4,477.00
Boharm	77	Boharm	"	1948	---	100	6,250.00
Balcarres	78	Balcarres	"	1948	---	100	7,203.00
Cabri	79	Cabri	"	1948	---	340	37,553.00
Gooseberry Lake	80	Corning	"	1948	---	2,500	8,783.00
Glenside	81	Glenside	"	1948	---	150	3,286.00
Mine Coulee	82	Neptune	"	1948	---	40	4,377.00
North Qu'Appelle	83	Fort Qu'Appelle	"	1948	---	100	2,386.00
Pasqua	84	Moose Jaw	"	1948	---	40	3,777.00
Stephens	85	Abernethy	"	1948	---	12	8,716.00
Wolseley	86	Wolseley	"	1948	---	20	1,800.00
Young	87	Young	"	1948	---	250	8,892.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Caron	88	Caron	Storage	1948	---	100	17,109.00
Thunder Creek	89	Kettlehut	Flood Irrigation	1948	---	---	27,204.00
Souris River	90	Weyburn	Flood Control	1948	---	---	11,998.00
Admiral Storage Dam	91	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Bateman	92	Gravelbourg	" " "	1949	400	114	4,739.00
Summercove	93	Mankota	" " "	1949	1,200	1,500	23,837.00
Scotsguard	94	Scotsguard	" " "	1949	2,000	3,000	1,962.00
Woodrow-Pinto Creek	95	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
Arena	96	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Dummer	97	Milestone	" " "	1949	500	200	4,742.00
Eagle Lake	98	Coleville	" " "	1949	2,000	3,000	1,920.00
Frenchman Flats	99	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Langenburg	100	Langenburg	Irr. & Stockwatering	1949	800	200	11,752.00
Lonesome Lake	101	Vidora	Irrigation	1949	900	800	2,771.00
Muenster	102	Muenster	" " "	1949	25	11	2,754.00
McIntosh Slough	103	Golden Prairie	" " "	1949	500	1,500	1,990.00
Richman Irrigation	104	Glen Bain	" " "	1949	---	1,000	4,607.00
Reciprocity	105	Glen Ewen	Irr. & Stockwatering	1949	2,000	1,750	27,410.00
Summit Creek	106	Bridgeford	" " "	1949	800	3,000	13,227.00
Sauder	107	Rush Lake	Storage-Irrigation	1949	---	800	29,115.00
Shaheen	108	Rush Lake	" " "	1949	---	300	9,028.00
Valley Park Irrigation	109	Valley Park	Irrigation	1949	1,200	---	8,133.00
West Osage	110	Cedoux	Irr. & Stockwatering	1949	300	600	4,905.00
Beadle	111	Beadle	Stockwatering	1949	---	2	997.00
Brook Community	112	Brook	" " "	1949	---	2	951.00
Caron Community Dam	113	Caron	" " "	1949	---	4	697.00
Cactus Lake	114	Cactus Lake	" " "	1949	---	2	730.00
Chapleau Lake	115	Montmartre	" " "	1949	---	3,530	8,208.00
Dry Lake	116	Forward	" " "	1949	---	600	9,729.00
Eastview	117	Pense	" " "	1949	---	200	5,970.00
Edenwold	118	Balgonie	" " "	1949	---	400	15,599.00
Elfros	119	Elfros	" " "	1949	---	25	7,321.00
Eatonia	120	Eatonia	" " "	1949	---	12	1,199.00
Hodgeville	121	Hodgeville	" " "	1949	---	5	2,748.00
Kindersley	122	Kindersley	" " "	1949	---	300	2,007.00
Kincaid	123	Kincaid	" " "	1949	---	10	2,539.00
Maxim Lake	124	Maxim	" " "	1949	---	5,000	20,472.00
Meeting Lake	125	Redfield	" " "	1949	---	100	2,683.00



Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Monet	126	Hughton	Stockwatering	1949	---	10	878.00
Mosbank	127	Mosbank	"	1949	---	2	875.00
Mennon	128	Waldheim	"	1949	---	2	976.00
Prairiedale	129	Superb	"	1949	---	2	987.00
Snipe Lake	130	Eston	"	1949	---	---	3,415.00
Sioux Reserve	131	Fort Qu'Appelle	"	1949	---	75	8,605.00
Truax Dam	132	Truax	"	1949	---	250	11,899.00
Camberly	133	Camberly	Irr. & Stockwatering	1950	200	100	2,106.00
Poplar River	134	Coronach	" "	1950	300	900	14,838.00
Baldon & Tilney	135	Baldon	Stockwatering	1950	---	4	780.00
Cutknife	136	Cutknife	"	1950	---	5	280.00
Crane Valley	137	Viceroy	"	1950	---	2	599.00
Delisle	138	Delisle	"	1950	---	45	4,899.00
East Borden	139	Borden	"	1950	---	60	526.00
Elrose	140	Elrose	"	1950	---	5	995.00
Fleming	141	Moosomin	"	1950	---	75	3,282.00
Fielding	142	Maymont	"	1950	---	50	918.00
Hague Dugout	143	Hague	"	1950	---	2	1,000.00
Stewart Valley Dugout	144	Stewart Valley	"	1950	---	3	799.00
Sturgis Community Dam	145	Sturgis	"	1950	---	60	20,961.00
Viceroy	146	Viceroy	"	1950	---	3	798.00
Readlyn	147	Readlyn	"	1950	---	3	800.00
Round Hill Water Users	148	North Battleford	Irr. & Stockwatering	1950	425	50	4,751.00
Melavel	149	Melavel	Stockwatering	1950	---	18	1,200.00
Mankota Dam	150	Mankota	"	1950	---	10	950.00
McDonald Creek	151	McCord	Irr. & Stockwatering	1950	400	50	4,992.00
Tribune Dam	152	Tribune	Stockwatering	1950	---	300	6,499.00
Bright Water Creek	153	Hanley	Irrigation	1950	2,500	3,500	858.00
Consul-Vidora	154	Vidora	"	1950	3,000	---	62,500.00
Alticane	155	Richard	Stockwatering	1951	---	2.5	858.00
Beaver Creek	156	Hanley	"	1951	---	200	7,998.00
Clearfield	157	Goodwater	Irr. & Stockwatering	1951	70	300	5,999.00
Dalmeny	158	Dalmeny	Stockwatering	1951	---	3	1,000.00
Denzil	159	Macklin	"	1951	---	2	975.00
Dunning	160	Radville	Irrigation	1951	120	200	3,566.00
Reford	161	Wilkie	Stockwatering	1951	---	160	1,814.00
Reward	162	Reward	"	1951	---	---	921.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Russell Creek	163	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
Salvador Smiley	164	Reward	Stockwatering	1951	---	5	1,000.00
Thunder Creek	165	Smiley	Irr. & Stockwatering	1951	600	300	9,998.00
Channel	166	Moose Jaw	" "	1951	300	7,000	10,007.00
Wheatlands, R. M. of	167	Parkbeg	" "	1951	100	60	3,452.00
Wood Mountain	168	Willowbunch	" "	1951	40	60	6,337.00
Braddock Dam		Braddock	Irrigation	Incomplete	2,000	1,600	83,999.00
Ceylon Reservoir		Ceylon	Irr. & Stockwatering	Incomplete	300	250	4,009.00
Doonside Dam		Wawota	Irrigation	Incomplete	1,500	1,500	1,307.00
Elfos		Foam Lake	Stockwatering	Incomplete	---	900	1,990.00
Gouverneur Dam		Ponteix	Irrigation	Incomplete	6,000	10,000	57,229.00
Macklin Storage		Macklin	Stockwatering	Incomplete	---	40	967.00
North Herbert Ext. (S.C. Ext.)		Herbert	Irrigation	Incomplete	---	---	359,069.00
Newburn Lake		Invermay	Irr. & Stockwatering	Incomplete	50	1,280	1,707.00
Terrell, R. M. of		Spring Valley	Stockwatering	Incomplete	---	10	1,347.00
West Poplar #1		Kildeer	Irrigation	Incomplete	750	1,000	2,124.00

# ALBERTA

Canada Land and Irrigation Project x 1		Medicine Hat	Irrigation	1936	45,000	---	80,000.00
Mountain View	2	Mountain View	Storage	1936	---	4,200	3,000.00
Wildhorse Storage	3	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Eastern Irr. District x 4		Brooks	Irrigation	1937	2,280	22,000	22,490.00
Rolling Hills	x 5	Rolling Hills	Irrigation	1938	25,000	---	46,839.00
Magrath	x 6	Magrath	Irrigation	1939	4,955	---	2,756.00
Leavitt Irrigation	x 7	Mountain View	"	1939	7,000	7,050	65,578.00
Atlee Gas Well #1	8	Atlee	Irrigation (Pump)	1939	7,000	---	12,423.00
Atlee Gas Well #2	8A	Atlee	"	--	---	---	14,300.00
Bull Pound Creek	9	Hanna	Stockwatering	1939	---	2,000	---

x - P.F.R. A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Bullshead Creek	10	Medicine Hat	Irr. & Stockwatering	1940	800	1,130	8,170.00
Raymond	x 11	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Bartman Dam	12	Cessford	Irr. & Stockwatering	1943	1,000	3,000	49,100.00
Graham Creek	13	Calgary	Stockwatering	1943	---	230	8,529.00
Seven Persons	14	Seven Persons	"	1943	---	800	12,103.00
Aetna Irr. District	15	Aetna	Irrigation	1947	8,000	---	82,004.00
Pothole Coulee	16	Magrath	Irrigation	1948	(Part of St. Mary Project)		
Berry Creek	17	Carolside	"	1948	10,000	30,000	158,884.00
North Fincastle	18	Taber	Irr. & Stockwatering	1948	2,000	4,000	17,943.00
South Macleod	19	Macleod	Irrigation	1948	6,000	---	82,614.00
Badger Lake	20	Lomond	Stockwatering	1948	---	10	2,990.00
Clear Lake	21	High River	"	1948	---	10,000	35,000.00
Franklin Coulee	22	Retlaw	"	1948	---	1,500	20,125.00
Hanna	23	Hanna	"	1948	---	500	29,498.00
Three Hills	24	Three Hills	"	1948	---	120	19,652.00
Vauxhall	25	Vauxhall	"	1948	---	30	5,883.00
Bell Lake	26	Pollockville	Irrigation	1949	700	1,500	4,738.00
Brunswick Coulee	27	Enchant	"	1949	500	205	4,631.00
Dead Fish Creek	28	Cessford	"	1949	4,000	5,000	47,832.00
Eureka Irrigation Project	29	Grassy Lake	"	1949	12,000	1,000	38,568.00
East Berry Creek	30	Rose Lynn	"	1949	1,500	750	9,677.00
Sounding Creek	31	Cereal	"	1949	8,000	5,600	51,988.00
Squaw Coulee	32	High River	"	1949	2,000	455	17,999.00
Serviceberry Creek	33	Near Drumheller	"	1949	1,200	500	17,518.00
Argyle, M. D. of	34	Stavely	Stockwatering	1949	---	80	10,912.00
C. Y. Water Users	35	Taber	"	1949	---	310	16,477.00
Snake Creek	36	Calgary	Irr. & Stockwatering	1950	500	300	15,976.00
Seyvern Creek	37	Rosebud	"	1950	1,000	1,000	24,990.00
Bare Creek	38	Comrey	"	1950	---	500	11,600.00
Ross Creek	39	Irvine	Irrigation	1950	3,000	5,000	47,998.00

x - P. F. R. A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wheatacre Dam	40	Rockyford	Irrigation	1950	1,600	1,500	12,976.00
Wintering Hills	41	Hussar	"	1950	1,000	500	9,993.00
Beaverdam Creek Reservoir	42	Castor	Stockwatering	1950	---	300	17,996.00
Ross Lake Comm.	43	Raymond	"	1950	---	300	7,987.00
Lake Beauvais	44	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Loyalist Creek	45	Hanna	"	1950	2,000	1,400	14,993.00
Irvine	46	Irvine	Irr. & Stockwatering	1950	70	100	4,799.00
Ambrose Flats	47	Irvine	Irrigation	1951	800	1,000	4,781.00
McAlpine Reservoir	48	Walsh	"	1951	600	1,000	15,917.00
McGregor Dam	49	Vulcan	"	1951	1,500	700	9,473.00
Pirmez Creek	50	Pirmez Creek	"	1951	6,000	500	20,998.00
Pershing Dam	51	Glenwood	"	1951	100	200	4,782.00
Vulcan Dam	52	Vulcan	"	1951	400	150	3,997.00
Reid Hill		Vulcan	Irrigation	Incomplete	1,000	700	6,166.00
Wheatacre #2		Rockyford	"	Incomplete	---	---	2,365.00
Esther Flood Irrigation		Macklin	"	Incomplete	4,000	5,000	2,992.00
MacKay Dam		Walsh	"	Incomplete	600	300	5,088.00
Meadow Creek Dam		Clareholm	"	Incomplete	1,500	---	1,708.00
Rough Meadow Reservoir		Coronation	"	Incomplete	3,200	---	2,471.00



# APPENDIX VI

## MAJOR PROJECTS

### IRRIGATION RECLAMATION

(Special Projects Not Directly Under P. F. R. A. Appropriation Vote)

To March 31, 1952

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
<u>MANITOBA</u>						
Riding Mountain	Dauphin	Drainage	Incomplete	---	---	396,752.00
<u>ALBERTA</u>						
Bow River (a) Purchase of Canada Land and Irrigation Company (b) Development and Construction	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
St. Mary Belly River Diversion	Lethbridge	Irrigation Irrigation	Incomplete	519,000	320,000	2,353,182.00 3,737,281.00
<u>BRITISH COLUMBIA</u>						
Cawston Benches	Keremeos	Irrigation (Pump)	1951	629	2,000	178,797.00
Chase and Johnston-Western Canada Ranching	Kamloops	Irrigation	1951	755	---	120,366.00
Western Canada Ranching #2	Kamloops	Irrigation (Pump)	1950	54	---	9,737.00
Lillooet-Pemberton	Pemberton	River Control	(1951 (Maintenance	---	---	1,012,623.00 43,252.00
South Thompson-Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	526,205.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	---	32,229.00

## PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

April 1, 1935 - March 31, 1952

	1935 - 1951	1951- 1952	Total
<b>ADMINISTRATION</b>			
Ottawa Administration	(a) 154,842	26,163	181,005
Regina Administration	(b) 736,347	77,508	813,855
Total	891,189	103,671	994,860
<b>EQUIPMENT</b>			
Purchase of Equipment	(k) 259,096	91,048	350,144
Upkeep of Equipment	(k) 170,991	110,709	281,700
Equipment Depot	599,140	156,987	756,127
Total	1,029,227	358,744	1,387,971
<b>LAND UTILIZATION</b>			
Supervision	385,947	39,927	425,874
Construction of Community Pastures	4,283,765	366,489	4,650,254
Pasture Improvements (Co-operative)	33,050	8,299	41,349
Operation of Community Pastures	1,639,287	254,162	1,893,449
Purchase and Development of Bulls	267,225	60,400	327,625
Re-establishment of Farmers	180,373	888	181,181
Grass Seeding and Experimental Regrassing	429,138	43,422	472,560
Total	7,218,785	773,507	7,992,292
<b>WATER DEVELOPMENT</b>			
Supervision	629,363	31,056	660,419
Small Projects including Engineering	10,086,688	846,105	10,932,793
Large Irrigation and Storage Projects			
Supervision	(d) 1,442,898	50,318	1,493,216
Construction and Improvements	(c & e) 4,686,259	543,190	5,229,449
Maintenance and Operation	2,688,252	342,874	3,031,126
Survey and Explorations	(f & h) 1,660,484	--	1,660,484
Purchase of Land	651,859	18,797	670,656
Total	21,845,803	1,832,340	23,678,143
<b>Cultural Work, Economic Surveys, etc., not included in P.F.R.A. since March 31, 1946, also Drought Area Relief Administration prior to 1940</b>			
	4,966,394	--	4,966,394
GRAND TOTAL	35,951,398	3,068,262	39,019,660

## SPECIAL VOTES UNDER P. F. R. A. ADMINISTRATION

1935- 1951

1951 - 1952

Total

Assiniboine River, Surveys and Construction

68, 410

68, 410

Lillooet Project B. C. Construction &amp; Explorations

938, 030

204, 837

1, 142, 867

Land Reclamation &amp; Development in B. C. (j)

1, 107, 233

304, 201

1, 411, 434

St. Mary's Irrigation Project - Alberta (i)

8, 833, 311

1, 639, 150

10, 472, 461

Bow River Project - Alberta

3, 034, 547

3, 704, 198

6, 738, 745

Red Deer River Project - Alberta (g)

565, 909

100, 602

666, 511

Other Miscellaneous Projects - Construction

210, 392

--

210, 392

Land Protection &amp; Reclamation - Manitoba

276, 751

120, 001

396, 752

South Saskatchewan River Project - Saskatchewan(g)

1, 733, 318

510, 144

2, 243, 462

Surveys and Engineering Costs (l)

1, 306, 417

865, 961

2, 172, 378

GRAND TOTAL

18, 005, 908

7, 517, 504

25, 523, 412

(a) Included in Cultural Administration to March 31, 1938.

(b) Included in Water Development Administration to March 31, 1938.

(c) Includes \$388, 923. 57 expended under the Supplementary Public Works Construction Act, 1935.

(d) Includes \$95, 198. 65 expended on St. Mary River Project (administration) in 1946-47.

(e) Includes \$300, 879. 29 expended on St. Mary River Project (construction) in 1946-47.

(f) Includes \$147, 530. 22 expended on St. Mary Project (administration) in 1947-48.

(g) The amounts shown include Red Deer \$325, 642 and South Saskatchewan \$370, 093 provided by Department of Reconstruction. In addition, the following amounts were paid from P. F. R. A. Vote: - South Saskatchewan - \$59, 568; Red Deer - \$33, 207.

(h) General Survey charges now being paid from other P. F. R. A. Votes.

(i) Amounts shown in notes (d), (e) and (f) to be added to this total.

(j) Veterans' Land Act expenditure not included.

(k) Expenditures until 1949-50 included under Land Utilization and Water Development.

(l) Previously under P. F. R. A. Vote (see item (g)).

## REVENUE RECEIVED FROM PROJECTS

## UNDER P. F. R. A. OFFICE

To March 31, 1952

Pasture Operation &amp; General Revenue 2, 086, 020

Irrigation Project Operation (under P. F. R. A. Vote) 316, 383

Irrigation &amp; General Revenue (Major Projects Vote) 420, 899

Total 2, 823, 302







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A56



*Canada, Department of Agriculture, Prairie Farm Rehabilitation Branch*

# REPORT

ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1952-53

CANADA DEPARTMENT OF AGRICULTURE  
Prairie Farm Rehabilitation Branch  
Regina, Sask



(71)  
A37  
1954/55

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The cover of this year's report depicts the Val Marie Irrigation Project in southwestern Saskatchewan.

At top left is the original greasewood vegetation found on the area before irrigation development.

At centre is the Val Marie Dam impounding the irrigation water which changed the scene to one of farming prosperity.

Lower right shows a few of the hay stacks which now dot the whole area.

Upper right. Cattle on the Val Marie Project no longer suffer from feed shortages.

Lower left. Associated with the irrigated areas of Val Marie is a 155,000-acre community pasture, well fenced and well watered. The combination of irrigation development and the establishment of the community pasture has brought agricultural security to this section of the Province.

For the complete story of Val Marie see page 20.

## INTRODUCTION

The Prairie Farm Rehabilitation Act, as originally passed in 1935, provided for the spending of \$4 3/4 million over a five-year period in measures to provide for the rehabilitation of drought and soil drifting areas in the Prairie Provinces. An amendment in 1937 extended the scope of the program by making specific provision for the withdrawal of poor quality lands from cultivation and the resettlement of the farmers operating such lands. By a further amendment in 1939 the five year limitation was removed and the Act was continued in force indefinitely.

Many policies and projects have been carried out under the Act in the sixteen years since it came into force. They vary widely in their nature and in their scope but each one has had as its objective the control of soil drifting, the better utilization of land or the conservation of water for farm purposes. This Report endeavours to describe the various types of undertaking included in the P. F. R. A. program and to give some idea of the results achieved to date.

The organization developed within the Department of Agriculture to administer the Prairie Farm Rehabilitation Act has also been made responsible for the construction of other irrigation, land reclamation and land development works which, because of size or location, are not included in the P. F. R. A. program but are provided for by special votes. These too are covered by the present Report.

While the Report is primarily concerned with the work done in the year 1952-53 it also deals in a general way with the P. F. R. A. and Special Project programs as a whole.



## ORGANIZATION AND ADMINISTRATION

The P. F. R. A. has its headquarters at Regina, Saskatchewan. It is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa.

The organization in Regina consists of the Director's Office, the Water Development Branch, the Engineering Services Branch and the Community Pasture Branch; the branch heads being responsible to the Director.

The Director's Office co-ordinates the activities of the different branches of work with the regional, district and special project offices in the field. It also administers resettlement and rehabilitation activities.

The Water Development Branch covers the extensive program of small and community water storage projects, and the development of small irrigation projects.

The Engineering Services Branch is responsible for Surveys, Soil Mechanics, Drainage, Hydraulics, Design, Hydrology, Air Survey and Engineering Geology, and Stream Bank Erosion work. The Soil Mechanics section is located in Saskatoon with a laboratory at the University. The Hydraulics Section also utilizes facilities at the University of Saskatchewan in the same city. The foregoing services are co-ordinated to establish the feasibility of the many types of projects that the staff is required to investigate. The construction of major irrigation and reclamation projects is administered through project headquarters and their activities planned and undertaken through the different divisions of work.

The Community Pasture Branch is an important part of land utilization. It undertakes construction of new pastures and associated facilities as well as the supervision for the operation of the pastures.

In addition to the Head Office in Regina there are Regional Offices in Winnipeg, Man., and Kamloops, B. C., plus 18 District Offices and nine Project Offices throughout the four western provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and complexity of the particular project.

Since the P. F. R. A. activities are closely allied to those of certain Provincial Government Departments every endeavour is made to co-operate with these agencies. Similarly, the Branch maintains a close liaison with other branches and departments of the Government of Canada upon which it relies for much of its basic information.

Fundamentally, the P. F. R. A. is organized to carry out a program of work aimed at a greater security and stability for prairie agriculture.

## CONSTRUCTION, EQUIPMENT AND SUPPLY DIVISION

The Construction, Equipment and Supply Division is responsible for servicing all branches of P. F. R. A. with vehicles, equipment and special materials as well as some key personnel for investigations, construction and maintenance work.

Most of the heavy construction work undertaken is done by contract, hence, the equipment available from P. F. R. A. consists mainly of special tools or machinery not commonly owned by contractors. Equipment for regular maintenance work which cannot conveniently be done by local contractors is likewise available.

Well-equipped shops are located at Moose Jaw and at Vanxhall on the Bow River Project to service and repair vehicles and equipment. A carpentry shop, machine shop and welding facilities are also available to facilitate field operations. A stock of equipment, spare parts and other materials is on hand at all times to meet running requirements as well as emergencies.

Vehicles needed by various branches are allocated according to the job requirements and a periodic inspection keeps vehicles serviceable and enables re-allocation as local vehicle requirements change. Some heavy transport equipment is on hand for moving P. F. R. A. equipment as well as hauling some classes of material directly from the supplier to the site of operations. This eliminates considerable handling of materials and results in a saving of time and labor.

A complete inventory of all equipment is kept as well as a current record showing its location.

Fire prevention, safety and sanitation in P. F. R. A. establishments are also supervised by this Division.

SASKATCHEWAN  
(TOTAL FENCED ACREAGE IN PASTURES 1,492,660.)

# COMMUNITY PASTURES

## UNDER THE

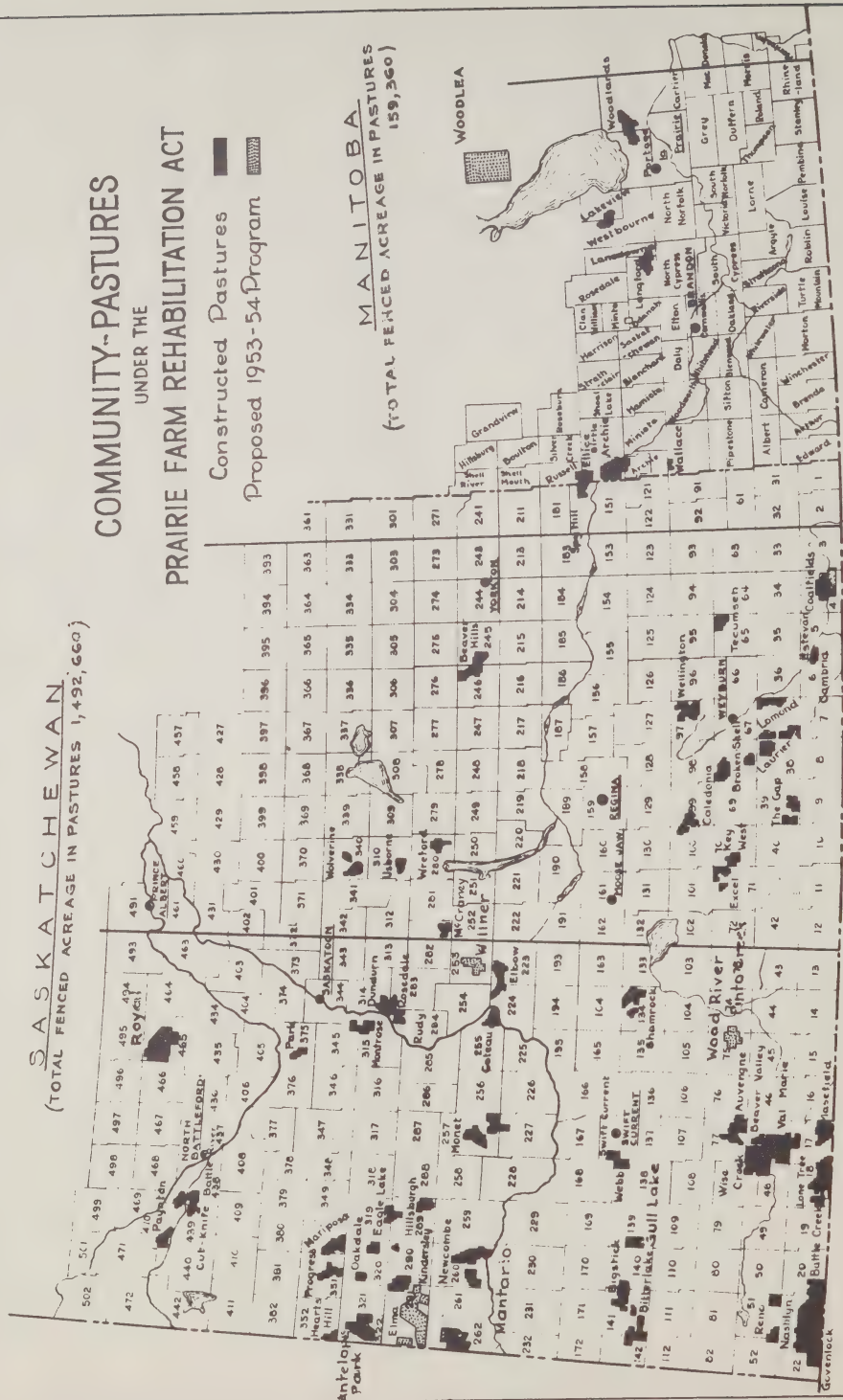
# PRAIRIE FARM REHABILITATION ACT

## Constructed Pastures

Proposed 1953-54 Program

MANITOBA

(TOTAL FENCED ACREAGE 159,360)



## COMMUNITY PASTURES

A most important section of the P. F. R. A. is that dealing with marginal lands. Attempts at raising crops on land unsuitable for such pursuits resulted in the past in many crop failures for the prairie farmer as well as erosion troubles which further depleted the soil asset.

Early in its administration the P. F. R. A. recognized the range and seriousness of this problem and in an effort to rehabilitate the land and the people a system of community pastures was organized.

Basically, the idea of community pastures was to retire to grass blocks of land that had proved marginal for cropping and then manage the new area for the grazing of livestock owned by local people adjoining the pasture area. Working closely with the Water Development Branch, the Community Pasture section was able to relocate many of the people thus deprived of land onto new, irrigated properties. Here, with financial and technical assistance, these people were given an opportunity of applying their labor to land capable of returning them a profit. Meanwhile, their old holdings began to prosper as community pastures by careful management and in many cases the introduction of new grasses. In addition the problem of erosion was overcome and land that was once a liability began to produce to serve the community and the nation.

To this time 59 operating pasture units have been established in Saskatchewan and Manitoba. In addition the Gull Lake Pasture, an area of 8,960 acres located in southwest Saskatchewan, was completed during the year and is now ready for operation.

Complete details of the history and progress of all community pastures will be found in appendices I and II of this report.

### PASTURE OPERATIONS

During the winter of 1951-52 there was considerable snow in southwest Saskatchewan and the quick, spring runoff caused minor damage to some dams and spillways on community pastures. These structures have all been repaired. In southeastern Saskatchewan and Manitoba there was very little snow and the spring runoff was very small. To counteract this the early season management of pastures in the area was directed towards utilizing first those fields where water shortages would likely occur later in the season. Along with the development of some additional springs and wells this management feature resulted in adequate water for livestock through to the fall roundup.

In the early part of the season there was, generally, little or no rain but there was an excellent carry-over of grass from the 1951 season. In the operation



of community pastures P. F. R. A. policy is to provide a good reserve of grass to meet any emergency. In June good general rains improved the situation and growth from that time on resulted in a fair carry-over for the 1953 grazing season.

#### FOOT-AND-MOUTH DISEASE

Owing of the outbreak of foot-and-mouth disease in Saskatchewan in the winter of 1951-52 the operation of approximately 20 pastures was affected during the spring. Quarantine regulations prevented a number of pastures operating until late in the season and also curtailed the movement of cattle into and out of the quarantine and buffer zone areas. In order to compensate for this it was necessary to carry more livestock in some pastures than in previous years. On the other hand pastures within the quarantine and buffer zones were not stocked up to full carrying capacity.

On the Laurier #38 and Lomond #2 Pastures approximately ten miles of double cross-fencing was constructed. These fences ran parallel to the existing cross-fences but left a width equivalent to a road allowance between each. In this manner the cattle were prevented from coming in contact with those in the other field.

During the time that the pasture areas were under quarantine extra help was engaged to assist pasture managers and Health of Animals Veterinarians in inspecting the stock daily for symptoms of the disease. As a precautionary measure 36 possible contact cattle were slaughtered and buried in the Lomond #1 Pasture. At no time during the outbreak were there any diseased cattle in any of the community pastures.

#### QUARANTINE OPERATIONS

During the outbreak of foot-and-mouth disease in the Regina area P. F. R. A. , acting for the Health of Animals Division, undertook the establishment of 17 checking stations on highways leading from the quarantine zone. Each station operated on a 24-hour basis and all vehicles leaving the quarantine area were thoroughly sprayed underneath and around the wheels with soda ash (anhydrous sodium carbonate). The occupants of all vehicles travelling to the United States of America were required to use a soda ash foot bath and any pets were also sprayed.

Also, on behalf of the Health of Animals Division P. F. R. A. undertook the disposal of animals infected with the disease. Providing pits to bury numbers of cattle presented a major problem since the ground was solidly frozen. In some cases the frost was thawed out with fires to allow bulldozers and scrapers to work, while in other instances holes were blasted out with dynamite.

Once the holes were excavated the infected cattle were transported from farms to disposal points in special watertight trailer decks constructed at the P. F. R. A. Moose Jaw Plant. Another truck, with a spray unit attached, followed



During the foot-and-mouth disease outbreak seventeen checking stations were setup for the Health of Animals Division by P. F. R. A. On Highway #39, south of Weyburn, Saskatchewan, vehicles are thoroughly sprayed to prevent spread of the disease. Ref. 2389.

the transport and sprayed it thoroughly as it left an infected property and again as it left the pit area to return to the highway. Every care was taken to prevent a spread of the disease and ensure its speedy eradication.

#### PASTURE SERVICES

Pasturage is allocated by the Pasture Advisory Committees on the following basis:

1. First pasture privileges are given to any farmer who has been moved out of the pasture area at the time of construction and who has relocated within the municipality where the pasture is located.

2. Second pasture privileges are given to bona fide farmers within the municipality or municipalities in which the pasture is located.
3. If the pasture can carry further stock, privileges may be extended to adjoining municipalities up to full carrying capacity.
4. The Committee sets a maximum number of stock which may be accepted from any one person. This may vary according to local conditions.

The following charges were made by P. F. R. A. for pasture services during 1952:

#### Grazing Rates

Cattle per month	. 75
Horses per month	1. 00
Sheep per month	. 07 (own herder provided)
Cows (breeding service)	3. 00
Colts born in pasture, flat rate	3. 00 up to and including November 30
Calves born in pasture, flat rate	2. 00 up to and including November 30

A minimum grazing charge equivalent to three months fees was levied against any animal recorded for pasturage.

#### Rates for Vaccine and Sundry Services

Encephalomyelitis	. 75 per double dose
Blackleg, Hemorrhagic and Mixed Vaccine	. 15 per single dose
Dehorning	. 50 per head
Warble and Horn Fly spraying (treatment at corral)	. 15 per head

Mineral Supplement	. 35 per head
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Castration:

Cattle under 6 months	1.00 per head
-----------------------	---------------

Cattle 6 months and over	2.00 per head
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Where extra hay or wood in community pastures was available, the following rates applied, subject to the approval of the pasture manager and confirmation from Head Office. All hay was put up on share basis, such being governed by quality and quantity available.

Dry Wood	. 50 per cord
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Green Wood	1.00 per cord
------------	---------------



On the Wellington Community Pasture, Tyvan, Saskatchewan, cattle are sprayed for horn flies with a boom-type spray unit. This is one of a number of services supplied at cost to pasture patrons. Ref. 2441.



## HAYING

Approximately 3,100 tons of hay were harvested on community pastures in 1952. This will be used for pasture requirements and any balance will be carried over as a feed reserve.

## REGRASSING

In 1952, 8,493 acres of community pasture land was seeded to grass. On 3,159 acres Fairway crested wheat grass was sown on 2,319 acres a mixture of crested wheat and brome grass and on the remaining 3,015 acres general mixtures containing such varieties as crested wheat grass, brome grass, alfalfa and reed canary grass. Within the community pastures an estimated total of 173,493 acres of once-abandoned farm land have now been reclaimed by this practice.

Crested wheat grass has proved over the years to be one of the best grasses for community pastures. It competes successfully with annual weeds and is of particular value in reclaiming run-down pasture land infested with prairie sage. These factors, combined with its drought tolerance and its tremendous fibrous root system give it an important place in holding down prairie soils which are subject to wind erosion.

## BREEDING POLICY

The breeding service provided for the community pastures has met with distinct success. Since its inception 1,190 good quality bulls have been purchased. During 1952, 18,181 cows were bred on community pastures. Breeding fees are levied to maintain the costs of the policy as a whole.

Aside from the value of the improvements in the type of cattle which have been achieved, the policy has also been a financial success. The revenues received have exceeded the expenditures and a reserve is now shown on the financial statement. This places the whole policy in a very favorable position even should inventoried values of the present bulls decrease in the future.

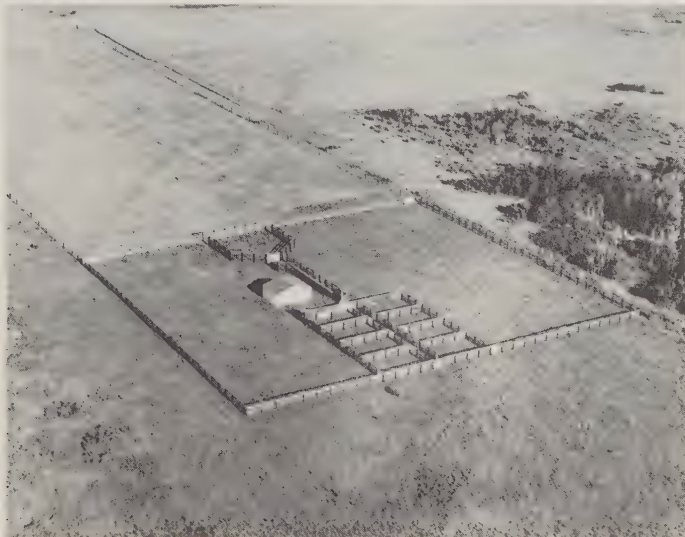
At the present time the pastures retain Hereford, Shorthorn and Aberdeen Angus bulls. Of these the Herefords greatly outnumber the other breeds. The selection of the different breeds is determined by the pasture committees which in turn represent the patrons.

## PASTURE CONSTRUCTION

Construction work was carried out on 54 pastures during the year. One hundred and forty-four miles of fencing was completed, the majority of it being cross-fencing aimed at the better utilization of grass and the establishment of breeding fields as well as the fencing of yards, watering facilities, boggy land and some private property.



October roundup activities on P. F. R. A. Woodlands Community Pasture at Poplar Point, Manitoba. Ref. 2581.



Solidly constructed corrals, buildings and fences are a feature of all community pastures. This is Montrose Community Pasture corral near Donavon, Saskatchewan. Ref. A574.

In two-thirds of the entire pasture area dams, dugouts, wells, windmills and troughs were installed. Twenty-two new Texas gates were built while 22 new corrals with holding pens were completed. At 21 of the pastures buildings, including houses, barns and garages were remodelled and repaired. Four large, old barns were taken over from the Health of Animals Division and dismantled, the lumber being used where possible for construction and repair work.

#### LIVESTOCK LOSSES AND INSURANCE

Pasture patrons are encouraged by P. F. R. A. to take out insurance on their livestock to cover losses due to accidental death. Losses caused by disease are not covered.

During the 1952 season 35 pastures carried insurance covering 51,477 head of livestock. Of this number 299 losses were reported, 258 of these being eligible for insurance. The difference in these figures is largely due to the slaughter of cattle as a precautionary measure during the foot-and-mouth disease outbreak.

A total of \$37,563.10 was collected in insurance premiums and payments on indemnity amounted to \$19,386.94.

Twenty-three pastures carried Mutual Insurance policies and 12 pastures Line Company policies.

## WATER DEVELOPMENT

Throughout its area in the three Prairie Provinces the P. F. R. A. provides both engineering and financial assistance to farmers and groups of farmers for the construction of water storage works.

Since 1935 the organization has assisted in the construction of 48,324 projects. Included in this figure, which represents an increase of 1,720 over 1951-52, are farm dugouts, stockwatering dams and small irrigation projects. The water stored in these works has been instrumental in bringing a greater measure of security for water supplies to the prairie farmer during dry periods.

Engineering and agricultural assistance in locating and operating these projects is provided free of charge by the P. F. R. A. During the 1952-53 season the following services were rendered:

### Agricultural

#### Dugouts

Preliminary calls	780
Final inspections	1,208
Miscellaneous inspections	376

#### Stockwatering Dams

Preliminary calls	222
Final inspections	66
Miscellaneous inspections	133

#### Small Irrigation Projects

Preliminary calls	552
Final inspections	188
Miscellaneous inspections	240

### Engineering

#### Stockwatering Dams

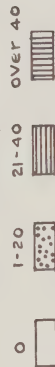
Surveys	249
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# P.F.R.A.

SMALL WATER PROJECTS

Per Township



Final certificates	226
Miscellaneous inspections	438
Small Irrigation Projects	
Surveys	459
Final certificates	179
Miscellaneous inspections	860

Activities under Water Development can be divided conveniently into three sections; one dealing with individual and neighbour farm projects; one with community projects; and finally one with irrigation projects.

#### INDIVIDUAL AND NEIGHBOUR FARM PROJECTS

These projects are intended to catch and store runoff water resulting from melting snow. The type of construction is either a dugout or a dam or an irrigation system drawing on the water stored by either of these works. A dugout is simply a strategically located excavation of sufficient capacity to meet the requirements of a farm unit. Stored water is used for stockwatering, a variety of irrigation schemes, domestic supply or combinations of these uses.

During the season 1,207 dugouts, 178 stockwatering dams and 335 irrigation projects were constructed on an individual and neighbour farm basis. The cost of this construction to the P. F. R. A. was \$265,575.95. This represents \$141,181.96 for dugouts, \$20,175.25 for stockwatering dams and \$104,218.74 for small irrigation projects. The financial assistance to construction is based on a rate of four and one-half cents per cubic yard of earth moved plus the cost of construction materials up to the following limits:

Dugouts	\$ 125.00
Stockwatering Dams	\$ 150.00
Small Irrigation Projects	\$ 350.00

With the inclusion of the projects completed in 1952, the total number of individual and neighbour schemes upon which assistance has been paid since the start of the Water Development Program are 48,324 made up of 39,544 dugouts, 6,077 stockwatering dams and 2,703 small irrigation projects.



During the 1952 season 1,207 dugouts have been constructed under the P.F.R.A. Water Development program. This dugout, in the Swift Current area, is similar to many thousands which now cover the western prairies. Ref. 1836.

## COMMUNITY PROJECTS

In cases where farmers form a Water Users' Association with the intention of storing and utilizing water on a community basis the P.F.R.A. will co-operate with the group. Rural Municipalities, having the same objectives as the Water Users' Association, are also included under this scheme.

Provided that the proposed project is feasible from all aspects the Government of Canada may assume the cost of the capital works involved. On irrigation projects this does not include the cost of the distribution system for irrigating. The Province concerned or the Water Users' Association usually undertakes this work.

In Alberta six projects were completed in 1952 and one project at Rough Meadow Reservoir remains to be completed.

In Saskatchewan four projects were completed and a further three are currently incomplete. In the eastern part of the Province investigations have been carried out for a proposed dam on Kaposvar Creek near Melville where 1,400 acre feet of usable storage would be of great value to agriculture in dry periods.

In Manitoba the Wawanesa Dam project was completed early in the year. This work consisted of enlarging the crest of the existing dam.

At Souris a new concrete dam was installed to replace a worn-out structure. Minor work is still required on the new dam. Both the Wawanesa and the Souris Dams will provide valuable extra storage for stockwatering and domestic purposes along the Souris River in the event of drought.



View of construction operations on a storage dam on the Souris River near the town of Souris, Manitoba. In dry years the flow of this river reaches critical, low stages and dams are necessary to ensure water for livestock and towns. Ref. A642.



At Morden on Dead Horse Creek modifications were made to the spillway, while at the Minnedosa Dam on the Minnedosa River minor repair work was undertaken.

North of Stephenfield on the Boyne River further investigations were made on a proposed damsite. Difficulties in foundation conditions have been experienced and, therefore, further surveys are being made.

Six possible damsites were also investigated along the La Salle River in response to a request for additional stockwatering facilities.

During 1952 the water supply in southern Manitoba reached a critical condition.

### IRRIGATION PROJECTS

Included under the Water Development section are a number of irrigation projects of smaller size than those classified as major irrigation. The water storage for these is provided by P. F. R. A.

Construction on these projects was confined to Saskatchewan in 1952 and most of the work was concentrated in the Wood River Basin. Repairs at Russell Creek were completed and a main canal system was constructed to supply water to a lateral system for over 500 acres of irrigable land.

The Gouverneur Dam, storing 10,000 acre feet of water, was completed along with three miles of main canal. This reservoir will supply water to a distribution system for 6,000 acres.

The Admiral Dam and the Cadillac Dam were both raised and repaired, while associated with the latter 400 acres of irrigable land were made ready for use.

#### Swift Current Project

Herbert

Construction work on the Herbert Main Canal on the Swift Current Irrigation Project was completed during the year. It will eventually be possible to irrigate 10,000 acres on this section of the project. Currently 3,600 acres are ready for irrigation.

Highfield-Hodgeville

Preliminary surveys have now been completed for the location of supply and drainage canals for this section. The storage capacity of the Highfield Reservoir was also increased.

## MAINTENANCE

In the spring of 1952 southwestern Saskatchewan and southeastern Alberta experienced the largest known runoff in their history. Heavy snowfall coupled with a quick thaw were the major contributing factors involved.

Despite the severity of the test, P. F. R. A. structures in the southwestern part of Saskatchewan stood up well. In only two cases was any major damage sustained.

In the case of the Duncairn Reservoir failure of portion of the concrete spillway on the dam caused concern for a period but timely action in by-passing the water through an emergency spillway averted possible flooding for the city of Swift Current. During the summer of 1952 extensive repairs were carried out on the Duncairn spillway.

During the height of the abnormal flood the Eastend Diversion Dam was overtopped and a breach of approximately 100 feet occurred in the main fill. This gap has now been repaired and an additional five feet has been added to the height of the original fill.

Throughout the flood period P. F. R. A. personnel and equipment were on hand at the danger points to reinforce structures and aid in the evacuation of people.

Lesser repair and maintenance work was carried out during the summer on a number of other structures which suffered minor damage during the flood.

## RESETTLEMENT AND REHABILITATION

### SASKATCHEWAN

The cover of this report presents a pictorial review of the development of the Val Marie Irrigation Project. Completed in 1937 this was one of the first irrigation projects undertaken by P. F. R. A. Located in the valley of the Frenchman River in southwestern Saskatchewan, where in past years dry conditions have caused repeated crop failures, the Val Marie Project now irrigates 6,000 acres.

During the "thirties" in this same area it was necessary to ship in hay, seed and food so that the people of the district could continue farming and maintain their families. The lack of winter feed and summer grazing forced farmers to market their cattle at one-half to one and one-half cents per pound. Remaining on the project and in the district were approximately 150 head of cows. To rebuild from this depleted state constituted a major rehabilitation undertaking.

The construction of the Val Marie Dam, along with its distribution system, was undertaken, in part, as a relief measure. In the land development of the project, which included the clearing of sagebrush and greasewood, the breaking and levelling of land and the installation of irrigation structures and ditches, the farmers of the district were employed to do all the work. This policy enabled them to earn sufficient money to maintain themselves.

The objective of the project was to move farmers from the surrounding dry lands to irrigated land so that they would be assured of feed supplies and have the opportunity of again building up their livestock herds with some security. Many farmers moved their homes to the project, while others remained on the dry land and farmed an irrigated plot of 40 acres on the project. Others again were already living on the project area. With no capital, depleted herds and credit unobtainable it was realized that it would be many years before farmers could fully rehabilitate themselves.

In 1938 the land was first divided into units of from 40 to 80 acres and irrigated. The Government of Canada, through P. F. R. A. , followed the policy of purchasing all privately owned land at dry land prices. In addition the Saskatchewan Government transferred all Crown land to P. F. R. A. This made up a total of 6,000 acres available for irrigation. Following this land policy, which was set up in 1939, farmers were given an agreement of sale on most of the land while on the remainder they were provided with a lease option. The agreement of sale allowed for payment to be made over a 14-year period. The land price took into account the water right cost as well as costs to P. F. R. A. for all land development work.

It was also recognized that if a livestock economy was to be established summer grazing was necessary. A community pasture of 155,160 acres was,

therefore, constructed around the project, and this went into operation in 1939. Abandoned farm lands were regrassed and water facilities were developed in the pasture. Crown lands for grazing were transferred to P. F. R. A. from the Saskatchewan Government and were incorporated into this area. The provision of summer grazing in the community pasture made it possible for farmers on the irrigated land to rebuild their cattle herds. The pasture management policy has been directed at all times towards maintaining a reserve of grass to meet a recurrence of drought conditions.



A sure water supply brings with it the certainty of hay and winter feed. A farmer on the Val Marie Project in southwestern Saskatchewan hauls alfalfa hay to his cattle. Ref. 2721.

## RESULTS OF VAL MARIE PROJECT

The results of this project since 1938 have been very encouraging. The expenditures made by P. F. R. A. have been more than compensated for by the revenue received. The purchase of land by Canada has, in 1952, been 50 per cent repaid by the farmers and it is expected that within a few years complete payment will have been made. In addition to this, all land levelling and development costs have been paid.



The capital cost of the Val Marie Project is one of the lowest in Western Canada for comparable developments. It is considered that the many indirect benefits have fully justified the investment, even though it was in part a relief project during the period of drought and depression prices.

The main benefit has been the rehabilitation of farmers. From 1937 to 1952 cattle herds have been increased from 150 to 3,500 head. While this increase took place during the period of high war-time prices, by 1950-51 farmers had accumulated sufficient cattle to be able to take advantage of post war prices. The majority of the irrigated land has been seeded to forage mixtures of alfalfa and grass providing adequate and sure supplies of winter feed. Where it was necessary to ship in a trainload of feed in 1937 from Eastern Canada, farmers are now harvesting over 5,000 tons of hay each year on the project. A sound livestock economy has been developed.

Other indirect benefits include an assured vegetable supply for the town of Val Marie. The town has installed its own pump enabling all citizens to have an irrigated garden. In 1937 five cars of vegetables were shipped in from Ontario whereas today farmers on the Val Marie Project are exporting vegetables to points outside their own immediate district. Community life has greatly improved and the social needs of education, health and other services are now a reality.

In 1949, which was just as dry as 1937, it was not necessary to import any winter feed into the area nor was there any occasion for farmers to reduce their herds. The project not only served its patrons but also helped to provide feed supplies for needy farmers at other and distant points.

In times of drought the Frenchman River normally goes dry but with the construction of the Val Marie Dam a safe water supply is assured for the project as well as for thousands of cattle along a 100-mile reach of the river.

The Val Marie Project is only one of the many projects developed by P. F. R. A. across the dry areas of the prairies. These projects are listed elsewhere in this report. Some are in the formative stage of development while others are nearing completion. Time is necessary for the full development of such projects. However, it is expected that another ten years will see the fuller development of the land and with it greater stability in the agricultural economy against drought.

Other areas in Saskatchewan are also making valuable contributions in the field of resettlement and rehabilitation.

On the Eastend Project, also located on the Frenchman River, a very successful season was experienced. The settlers on this project utilize the feed and grain produced for maintaining and fattening their livestock. They own 1,500 head of cattle and winter feed 2,000 sheep.

In the Consul district on the Richardson-McKinnon and Nashlyn Projects P. F. R. A. has, in recent years, carried out extensive renovation work and the distribution system is now capable of irrigating 3,000 acres with water diverted from Battle Creek. At present 30 farmers, producing livestock, are utilizing these lands for feed production. In 1952 P. F. R. A. levelled 1,000 acres and seeded 400 acres to forage crops. Forty per cent of the developed land is now in forage production. These improved lands will be settled in 1953. The present settlers own 1,200 head of cattle and with the utilization of feed produced on the projects they will be able to increase their livestock and stabilize their agricultural activities.

On the Maple Creek Project, where farmers are particularly aware of the advantages of forage crops in building soil fertility and facilitating crop rotations, 600 acres were seeded to forage in 1952. In addition P. F. R. A. seeded 200 acres of forage on improved lands. The total acreage now in forage is 2,600 or 50 per cent of the improved irrigable lands.

An area of 300 acres bordering Maple Creek Flats on the west is currently being developed to serve more people in the district.

On the Swift Current Project P. F. R. A. carried out an extensive forage seeding program in 1952 establishing 400 acres of new hay land.

## ALBERTA

On the St. Mary Project in Alberta the Alberta Government is continually settling more people on lands irrigated by the St. Mary Reservoir.

On the Bow River Project developmental work will have over 25,000 acres of irrigated land available for resettlement in 1953. During 1952 a start was made in resettlement. Five thousand acres of new land was leased to farmers who have been on crop failure land for many years. Their first year's operations were quite successful and they adapted themselves very well to the change from dry land farming to irrigation. Preparations are now being made to move several hundred farmers during 1953 and 1954.

Farmers that are moved to the Bow River Project are from the continuous crop failure areas in southern Saskatchewan and southern Alberta. No direct sale of irrigated land is made to the resettled farmers but an exchange of dry land for irrigated land is made. Such dry land must be taken out of future crop production and ultimately it is incorporated in new or existing community pastures.

Stability for water supply for irrigation has been provided for over 650 farmers living on the Vauxhall section of the project. The main canal and distributory system has been improved so that good irrigation practice can now be followed. Drainage ditches have been renovated and in general great improvement has been made in water distribution and use to those farmers who have created a large investment over the last 25 years.



On the St. Mary Project irrigation has brought a new and diversified agriculture. Peas harvested on this farm go to a canning factory built to serve the new irrigation development. Ref. C226.



The first two families to take up residence at the new townsite of Hays, Alberta on the Bow River Irrigation Project. In 1953 over 25,000 acres will be available for settlement on this project. Ref. 2562.

Besides the larger projects which have been discussed above, the P. F. R. A. has also given financial and/or engineering assistance in establishing a total of 2,973 small individual irrigation projects throughout its area. These small developments have played an important part in the rehabilitation of the prairie people possessing them.

TABLE SHOWING RESETTLEMENT ON IRRIGATION PROJECTS

<u>Project</u>	<u>Number of Farmers Resettled</u>	<u>Total</u>
South Cypress--Saskatchewan		
Val Marie	93	
Eastend	55	
Richardson-McKinnon	27	
Small Units	39	214
North Cypress--Saskatchewan		
Maple Creek	135	
Swift Current	209	344
Rolling Hills--Alberta	136	136
Other Organized Projects		
Saskatchewan	961	
Alberta	919	
Manitoba	27	1,907
Small Individual Projects		
20-200 Acres	2,973	2,973
	Grand Total	<u>5,574</u>



## ENGINEERING SERVICES

For all its projects P. F. R. A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is essential for sound planning and construction, a number of divisions are set up under the general heading of Engineering Services.

### HYDROLOGY DIVISION

In April, 1952 P. F. R. A. established an Hydrology Division to undertake important water supply and water use studies on both watershed and project bases. Water studies of this nature are a prior step to the initiation of detailed surveys. In addition to these functions the Division determines the flood potential on various streams for use by the Design Division in the designing of spillways.

At the present time the Division is engaged, in addition to many studies of a minor character, in making a complete water supply and water use study of the Qu'Appelle River Basin, the Bow River Basin and certain other drainage basins south of the Cypress Hills.

The Hydrology Division carries out the studies for the Prairie Provinces Water Board in addition to its primary P. F. R. A. functions.

Since the inception of this hydrological work in 1948 the Division has produced the following reports:

- |                                    |   |
|------------------------------------|---|
| Water Board Report #1.             | "Summary Report of Recorded and Natural Monthly Flows at Certain Points on the Saskatchewan River Systems". November, 1950. |
| Water Board Report #2.             | "Stream Flow at Three Selected Points on South and Main Saskatchewan Rivers After Alberta's 1949 Request". December, 1950.  |
| Water Board Report #3.             | "Preliminary Report on Effects of Certain Major Projects in the Saskatchewan River Drainage Basin". March, 1951.            |
| Appendix to Water Board Report #3. | "Period of Study 1911-23". December, 1951.  |
| Water Board Report #4.             | "Comparison of Two Alternate Developments in Saskatchewan River Basin". October, 1951.                                      |
| Water Board Report #5.             | "Evaporation from Lakes and Reservoirs on the Canadian Prairies". December, 1952.   |

Hydrology Report #1.

"Full Development Possibilities in the  
Saskatchewan River Basin". June, 1952.

Hydrology Report #2.

"Determination of Peak Discharges on Certain  
Cypress Hill Streams--Flood of 1952".

### SURVEYS DIVISION

Survey work plays an essential and major part in the P. F. R. A. planning program by providing field data relating to the location, design and construction of projects. P. F. R. A. surveys may be divided into three groups: surveys for structures, surveys for irrigation and reclamation planning, and legal surveys.

1. Structure surveys. The first stage in surveying for construction is the reconnaissance survey. Depending upon the size and complexity of a project this may vary from an on-the-spot appraisal by an experienced officer to the use of a number of survey parties for the preparation of maps. The objective is to obtain sufficient information to assess the feasibility of a project with a limited expenditure of time and money.

Assuming a project is feasible in the light of a reconnaissance survey a preliminary survey is then completed. This supplies details of topography and basic data in the vicinity of the proposed structure which is then utilized by the Soil Mechanics Branch and the Design Office.

Once the project moves into construction, final surveys are made for the purpose of supplying lines and grades needed by the contractor. In addition they supply figures for the purposes of payment on material excavated or placed by the contractor.

2. Surveys for irrigation planning and reclamation follow in broad outline the same scheme of reconnaissance, preliminary and final surveys as discussed in the previous section. Aerial photography is being used increasingly in obtaining necessary preliminary topographical information where large areas are involved.

3. Legal surveys. These surveys are usually made for the purpose of acquiring transfer or title to the land and, hence, are made only for projects in the development stage. Legal surveys in 1952 were confined to Alberta and Saskatchewan. In Alberta the work was carried out on the St. Mary and Bow River Projects while in Saskatchewan it took in a number of smaller projects being constructed by the Water Development Branch.



P. F. R. A. surveyors take levels on the St. Mary Project northeast of Taber, Alberta. Ref. 1817.

## RED DEER RIVER PROJECT

Further reconnaissance survey work has been carried out on the proposed Red Deer River Project to determine the feasibility of conveying water to lands east of the project in the vicinity of Kerrobert and Luseland in the Province of Saskatchewan. Present indications appear favorable for such a development but much more detailed investigation is necessary before the feasibility of such an undertaking can be established with certainty.

More detailed references to surveys in general will be found under individual projects described elsewhere in the report.

## SOIL MECHANICS AND MATERIALS DIVISION

The main activities of this Division involve field exploration, laboratory testing, design studies and reports, and inspection on construction projects.

The exploration section is concerned with drilling, sampling, and miscellaneous field tests connected with investigations on proposed dams, canals and foundations for structures. To carry out this work the Division is equipped with two rotary drills, one cable tool drill, two power earth augers and one horizontal drill for installing drains. In addition to the power drills, equipment is available to field four hand-operated washbore outfits which are used to take undisturbed samples up to 100-foot depths on small projects where it is not feasible to operate the large drills. During 1952 these units drilled a total of 62,000 feet of test holes.

During the year laboratory work has been carried on at Saskatoon and also at field laboratories located at the South Saskatchewan River Damsite, St. Mary Dam and Travers Dam in Alberta. Investigations have been conducted on cements manufactured in various plants across Canada. A search has been made for a standard laboratory aggregate and all possibilities have been evaluated by means of the durability test. The latter test has also been revised and standardized. Laboratory trained concrete inspectors are available for field inspections as required.

On the St. Mary Project soil and concrete inspection was provided in connection with the distribution system and canal structures. Construction control was provided during the work on both the Chin and Grassy Lake Dams. Special test installations were made to observe water pressures and foundation movements at the Chin Dam and preliminary exploration of the proposed Waterton Damsite was completed during the year.

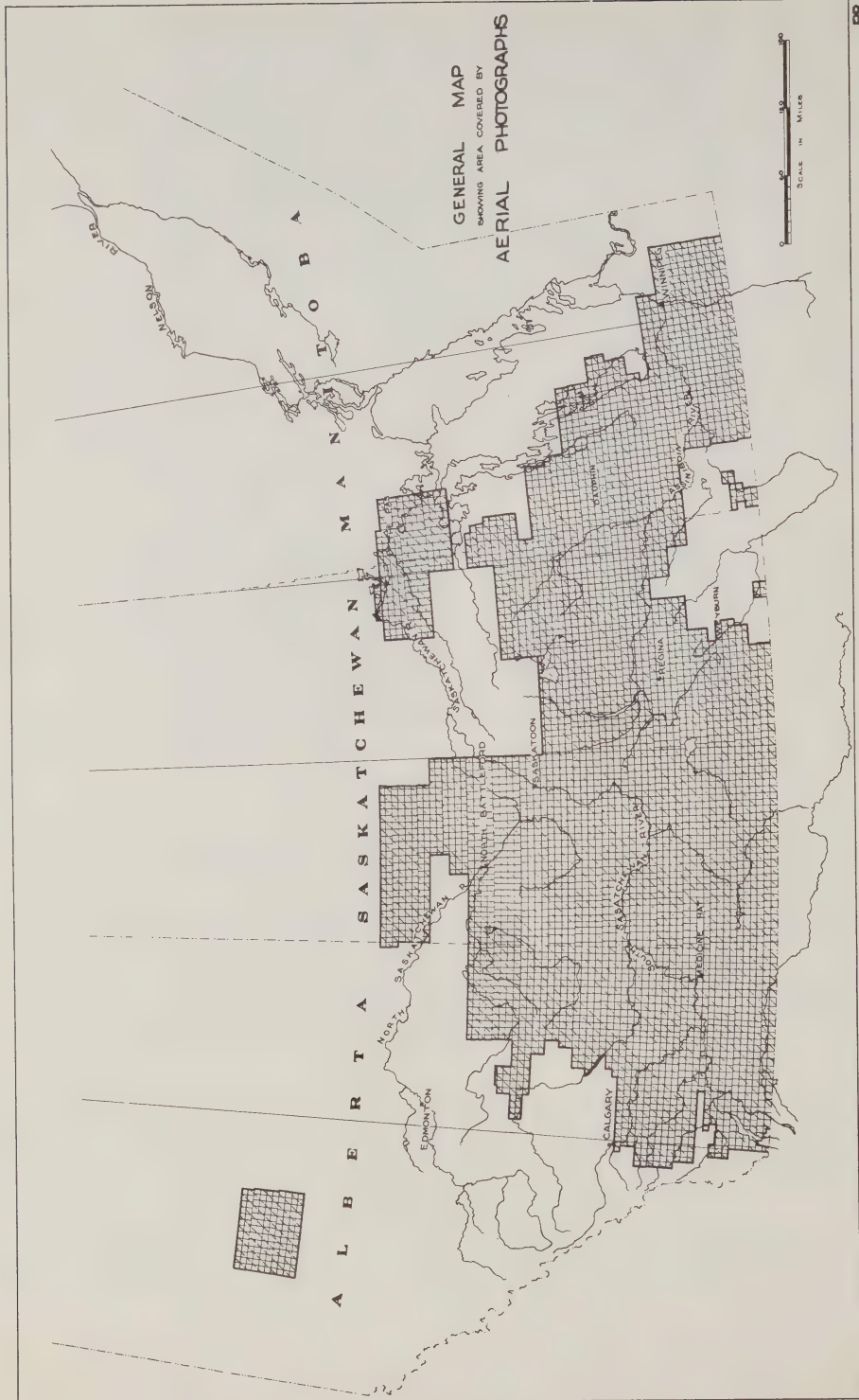
On the Bow River Project work consisted primarily of investigations of foundations and construction materials along with soil and concrete testing in conjunction with construction operations.

During the year the preliminary phase of field exploration on the South Saskatchewan River Project was completed. In the laboratory the testing associated with this work has been completed with the exception of long time tests on the Bearpaw Shale which will require several years. In the office, design studies are being completed and summaries covering all the work are being prepared.

In British Columbia during 1952, exploratory work and soil testing was carried out on behalf of the Fraser River Basin Board for earth dams at the south end of Harrison Lake.

During 1952, 15 damsites were investigated as well as the Pasquia Project near The Pas in Manitoba. In addition inspection and advice regarding construction was given on current projects. A long range program to study movements in earth dams and concrete structures was also initiated during the year.





Limited experimental lining work aimed at controlling seepage was carried out on canals on the Swift Current, Maple Creek and St. Mary Projects as well as on two dugouts. Inspections were made on existing linings.

### AIR SURVEYS AND ENGINEERING GEOLOGY DIVISION

The recently-established Air Surveys and Engineering Geology Division of the P. F. R. A. is bringing the benefits of the relatively new and important science of airphoto interpretation to the organization. From a study of airphotos the Division will be able to effect great savings of time and money normally applied to surveys and geological exploration.

Investigations involving airphoto interpretation of basic information relative to geology, soil characteristics, topography, drainage and cultural use of the land are now under way.

On the Bow River Project the Division is engaged on the detection and prediction of land slides in areas where construction works are projected. Similarly, information regarding alkali and seepage problems has been obtained for areas of proposed construction and in some cases alternative sites have been proposed. Soil studies and drainage studies have also been made for this project in connection with the laying out of distribution systems.

Studies of airphotos have been made to aid in the delimitation and assessment of potentially irrigable lands in the South Saskatchewan River drainage basin and further investigations have aided in the location of field stone for riprap purposes.

Land reclamation studies have been made on the Swift Current Project with a view to locating pumping station sites and mapping natural drainageways situated around and above land-locked basins. These studies will aid materially in determining the feasibility of pumping excess waters from flooded farm land.

An airphoto investigation is currently progressing on the effect of changes in land use on accelerated erosion along the Riding Mountain Escarpment in Manitoba and the consequent deposition of sediment upon fertile farm lands near the base of the escarpment.

To facilitate these investigations the P. F. R. A. has an air-photo library containing some 250,000 aerial photographs. These photographs cover about 70 per cent of the area of Saskatchewan between the International Boundary and the 51° 50' parallel of latitude. In Alberta virtually all that area between the International Boundary and Calgary is covered as well as the central-east section up to the 51st parallel and west to R13, W4. In Manitoba coverage is available for almost all of the southern and western regions.



Airphoto interpretation, a new and important branch of study, is resulting in major savings for P. F. R. A. In the Regina Office a stereoscope provides a third dimensional effect and aids in identifying physical features. Ref. 2818.

#### DESIGN DIVISION

The primary function of the Design Division is the production of working drawings and specifications relative to structures and projects. To this end the Division works in close co-operation with field engineers, the Soil Mechanics and Materials Division, Hydrology Division and the Air Surveys and Engineering Geology Division, which supply much of the ancillary information so necessary to the design of a structure or the layout of an irrigation system.

The Chief of the Design Division is assisted by a permanent staff of eight engineers who co-ordinate all the field data and information supplied from other divisions. The Design Division carries out all necessary hydraulic, structural design and layout studies required for the preparation of final working drawings. Six full-time draftsmen are employed by the Division.



A major part of the year's work was spent on studies and designs in connection with the Bow River Development. These included canal drop-structures, chutes, turnouts and other irrigation structures. The layout of several irrigation systems was also completed. Other work included studies and designs of the Travers Reservoir and associated structures.

For Manitoba and Saskatchewan the Division designed a number of dams with reinforced concrete spillways for stockwatering, irrigation and water conservation purposes.



In the Design Division information, supplied by other Divisions of the Engineering Services, is considered and evaluated before final plans are drawn up. Ref. 2816.

During the year the Division carried out an hydraulic model testing program. Models of structures under investigation were produced by the Moose Jaw plant of the P. F. R. A. and tests were conducted in the hydraulics laboratory at the University of Saskatchewan. Much valuable information was obtained from these tests and in all cases improvements in design were effected on the original plans. General model studies were made on chute-drops and hydraulic jumps on sloping floors while specific studies were carried out for the repairing of Duncairn Spillway, Lake



McGregor Outlet works and Cadillac Spillway. In addition model tests were carried out for the proposed spillway on the new Travers Dam.

### DRAINAGE DIVISION

The Drainage Division was organized in 1949 to investigate areas on irrigation projects operated by P. F. R. A. where waterlogging and accumulation of salts are damaging lands; to plan reclamation measures for such areas; and to plan preventive measures where subsurface and surface soil conditions require them.

During the past season most of the efforts of this Division were devoted to the Bow River Project. Some 4,000 acres in this project have become more or less abandoned because of a rising water table and salt accumulation in the root zone. The first attack upon the problem has been the improvement of surface drainage. A main drain to the Oldman River has been constructed in the Vauxhall district and a start has been made on the construction of laterals. This lateral system will eventually provide a drainage system to which farm drains can be converted.



Expanse Lake on the Bow River Project is drained by a new 20-foot channel excavated by the Drainage Division. Ref. A634.

Some tile underdrainage has also been undertaken for the purpose of reclaiming waterlogged and salty lands. This work has proved effective in bringing a considerable area of abandoned land near Vauxhall back into production.

In addition to the construction work, field information required to plan the extension to the drainage system was obtained.



On land near Vauxhall, Alberta, a mechanical tile layer installs drains for reclaiming waterlogged and salty land. Ref. 2633.

On the Maple Creek Project additional sections of canal through **pervious** types of soil were lined to cut down the amount of water escaping from the canal. On the Upper "V" Project an experimental subsurface drainage project by well pumping was put into operation and results have been encouraging. About one-half section of waste land will be reclaimed and returned to production.

#### STREAM BANK PROTECTION

Stream bank protection work was continued during the season around Dauphin and Brandon in the Province of Manitoba.

While bank erosion may be controlled effectively by heavy and expensive mechanical works, the objective here was to establish vegetative control or a combination of vegetative and mechanical control to achieve the same long term results. From the findings of these studies it will be possible to lay down methods for combating similar situations throughout the P. F. R. A. area.



A pile line with trees and brush protects an eroding shale bank on Edwards Creek, near Dauphin, Manitoba. The slowing of the current behind the revetment causes a deposition of silt which is later stabilized with vegetation. Ref. 2763.

In the Dauphin region, 2,055 feet of cable piling revetment was completed along with 660 feet of floating tree revetment. This work concluded the exploratory stream bank construction program along the Edwards Creek started in 1949. Over the four-mile reach of the stream which was treated, five different types of protection have been tried, four of which have proved successful up to the present time.

On the Assiniboine River near Brandon, 2,050 feet of bank was sloped and riprapped while 2,245 feet of brush matting was installed to give protection to the upper bank slopes. This type of rock and brush mat protection has proved very adaptable to the Assiniboine River in these reaches.

## MAJOR IRRIGATION AND RECLAMATION PROJECTS

The administration of Major Irrigation and Reclamation Projects involving large expenditures of money is undertaken by P. F. R. A. for the Government of Canada. These projects may or may not be located within the P. F. R. A. area and are financed by special votes passed by Parliament as distinct from those projects covered by the annual P. F. R. A. appropriation. For this reason Major Irrigation and Reclamation Projects are sometimes referred to as Special Projects.

### BOW RIVER PROJECT

This is the second season in which work has been carried out on the Bow River Project in Alberta. The weather has been excellent both from the point of view of construction as well as for crop production in the area. The annual rainfall of 11.83 inches was well distributed throughout the growing season and there were no frosts from May 7 until September 15.

The labor supply presented some difficulty but towards the end of the season it ceased to be a factor and materials and equipment were both in good supply.

Conditions throughout the project are very good and the farming community is showing enthusiasm for what is being accomplished.

### NEW CONSTRUCTION

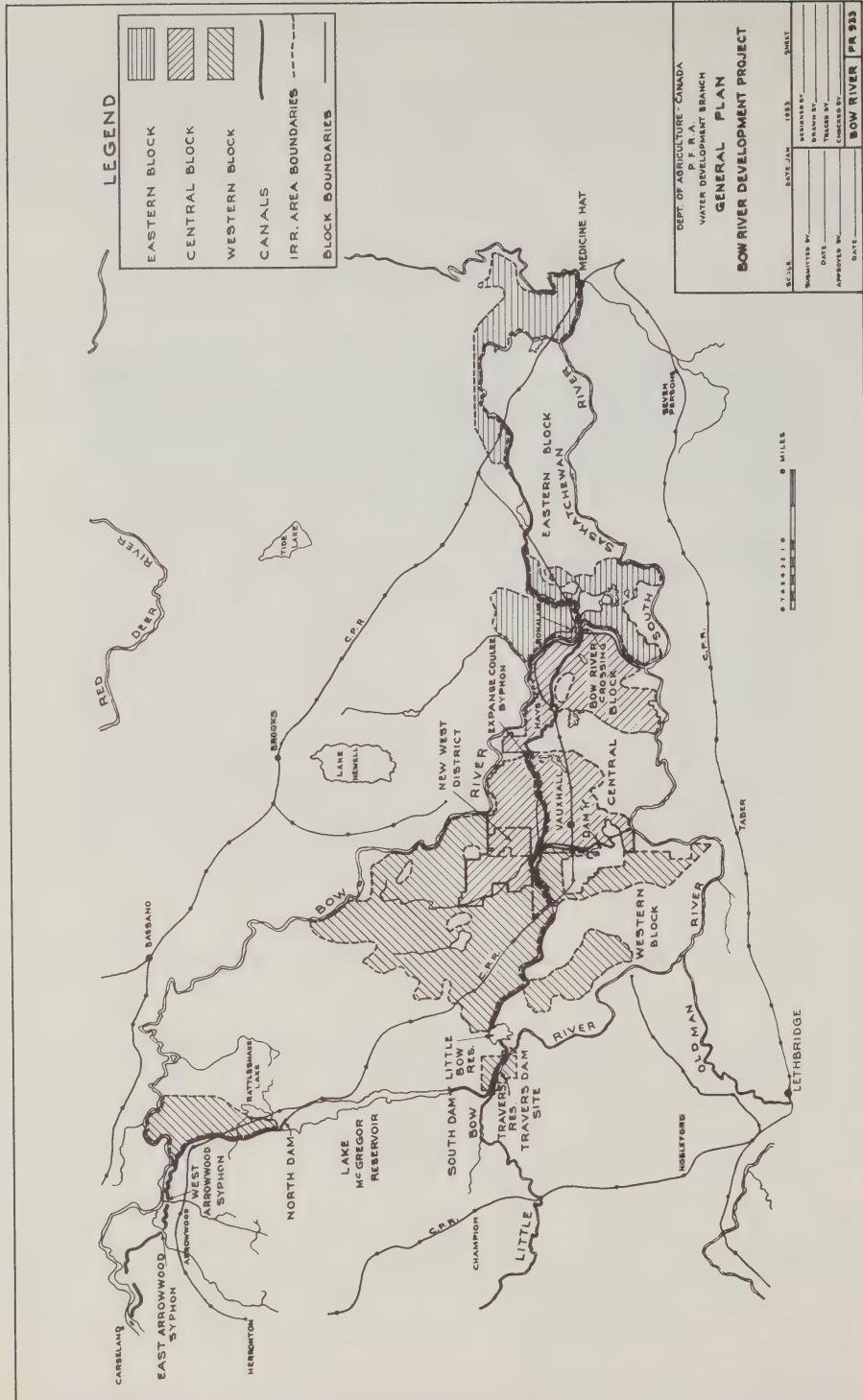
From the map it will be seen that the project is divided into Western, Central and Eastern Blocks. In the Western Block, between Carseland the northernmost point of the project, and the south end of McGregor Lake, the East and West Arrowwood Syphons have been completed as well as seven pre-cast concrete bridges which cross the main canal. Over the same area 32 miles of canal have been cleaned, enlarged and in some places relocated. This leaves 12 1/2 miles yet to be renovated. Crested wheat grass has been seeded on 450 acres of canal banks and borrow-pits.

The north dam on Lake McGregor was enlarged and similar work initiated on the south dam.

Work on the Travers Dam has been continued and the height of the fill is now 55 feet. This represents an approximate yardage of 1,600,000 out of a total of 4,500,000 required to complete the dam.

The work of enlarging and strengthening the Little Bow Reservoir was completed, increasing its capacity from 22,000 to 30,000 acre feet.







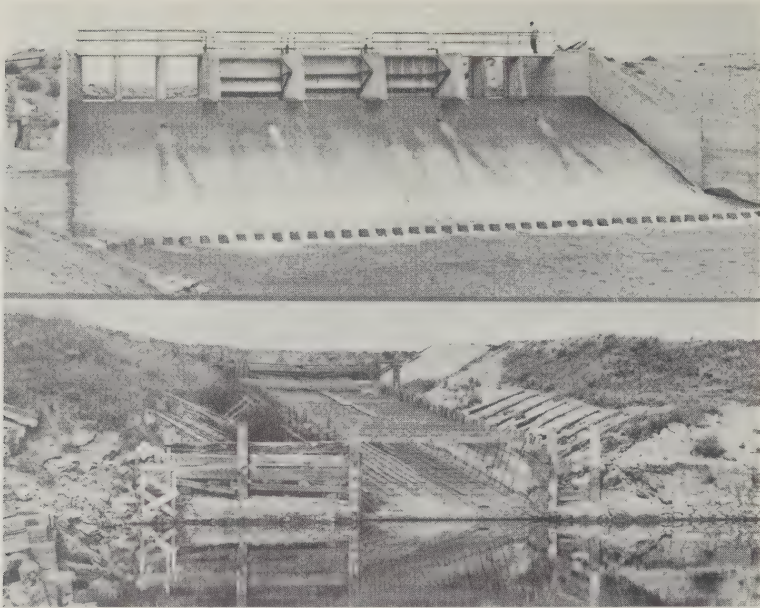
With 1,600,000 cubic yards of dirt incorporated in its broad base the Travers Dam on the Bow River Project is now one-third completed. Dust rising from the dam is caused by earth-moving machinery. Ref. A623.

In the Hays district of the Central Block the Expanse Coulee Syphon, one balancing reservoir, and associated canal works were completed along with five drop structures. Distribution systems were completed south of Reservoir "H" covering 1,100 acres as well as 13,500 acres in the same area. This contract is 75 per cent completed.

#### OPERATION AND MAINTENANCE

Due to the favorable rainfall the amount of water delivered to farmers throughout the project was lower than average.

Total water delivery, 1952	20,722 acre feet
Total water delivery, 1951	8,176 acre feet
Normal delivery	42,000 acre feet
Peak year, 1949	56,766 acre feet



Renovation and relocation of the original works of the Canada Land and Irrigation Company has been a major activity on the P. F. R. A. Bow River Project during 1952. The new concrete chute replaces a wooden structure on the main irrigation canal near Travers Dam. Ref. C231.

Three thousand acres of land in the Vauxhall and Hays districts were irrigated this year for the first time.

Most of the 1952 maintenance work was carried out in the Vauxhall district and involved the renewal or repair of 184 wooden structures requiring 109,095 board feet of lumber. Seventy-two new wooden structures were installed involving a further 79,403 board feet. Eighteen concrete structures, requiring 310 yards of concrete, have replaced wooden structures and a further 27 are currently in the course of construction.

In all, approximately 40,000 lineal feet of canals and drains were cleaned by dragline while the Gregorson ditcher accounted for another 60 miles of the same type of work.

The general renovation and improvement of the project as a whole is progressing favorably.

## NEW WEST IRRIGATION DISTRICT

During the season the New West Irrigation District (see map) was disbanded and became part of the Bow River Project. The district, comprising about one-half of a township, was irrigating about 4,500 acres. Thirty structures were renewed, five repaired and fifteen new structures were installed as a part of the maintenance and operation program.

## DRAINAGE

A start has been made on the problem of draining lands which have been under irrigation for 30 years.

During the year a number of large and small open drains were constructed in addition to the completion of two deep, open drains started in 1951. Approximately two miles of tile drains were installed.

In all, 123,716 feet of drains were constructed including 26,400 feet of main ditch carrying water to the Oldman River. This program has reclaimed a substantial area of land on the project which can now be used for production.

## RESETTLEMENT

Forty-two parcels of land in the Hays district were settled in 1952. Thirty-three farmers were from southern Saskatchewan and eleven veterans were also settled. Nineteen farmers seeded crop in 1952 and yields were very fair. Land broken in 1951 has been double-disked twice and is in excellent condition for cropping in 1953. Canal banks and roadways in the area have been seeded to crested wheat grass. It is expected to have a much larger acreage settled in 1953 by farmers from those areas where crop failures are continuous.

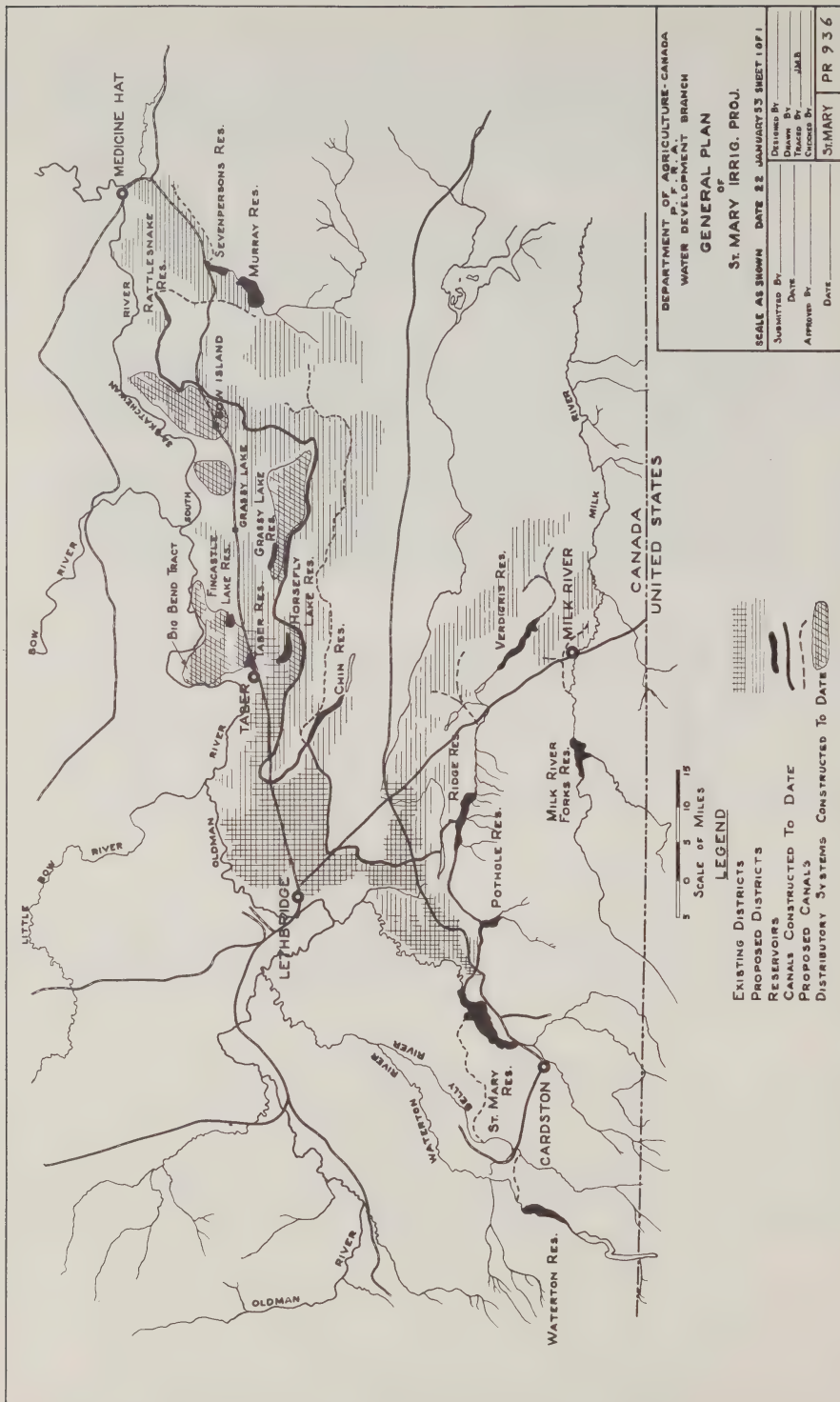
## COLLECTIONS ON CONTRACTS

In respect to contracts with farmers previously held by the Canada Land and Irrigation Company and now transferred to Canada, the collections in 1952 from 494 contracts have been very satisfactory. It is expected that, by 1953, 65 per cent of the contracts will be paid up.

## ST. MARY IRRIGATION PROJECT

In 1952, 186,000 acre feet of water was delivered to approximately 130,000 acres of land on the St. Mary Project from the newly constructed St. Mary Reservoir. In a drier year the same acreage would have absorbed closer to 250,000 acre feet. The greater part of the water was applied to 120,000 acres in the older irrigation districts of Magrath, Raymond, Lethbridge-Coaldale and Taber. The remaining





DEPARTMENT OF AGRICULTURE-CANADA  
WATER DEVELOPMENT BRANCH

**GENERAL PLAN**  
OF  
**ST. MARY IRRIG. PROJ.**

SCALE AS SHOWN DATE 22 JANUARY 53 SHEET 1 OF 1

Submitted By:	Checked By:
Date:	Date:
Traced By:	Checked By:
Approved By:	Date:
ST. MARY PR 936	

5 0 5 10 15  
Scale of Miles

**LEGEND**

EXISTING DISTRICTS  
PROPOSED DISTRICTS  
RESERVOIRS  
CANALS CONSTRUCTED TO DATE  
PROPOSED CANALS  
DISTRIBUTARY SYSTEMS CONSTRUCTED TO DATE



An aerial view of the first wheat crop grown on newly-cultivated, irrigated land near Hays, Alberta, on the Bow River Irrigation Project. Ref. A585.

10,000 acres irrigated is located north of Taber on a new area known as the Big Bend Tract. More than 8,000 acres of this area was given over to grain crops as a start in the new development but in addition the following crops were grown:

Sugar beet	600 acres
Canning corn	780 acres
Canning beet	150 acres
Canning peas	320 acres
Beans, pumpkins, etc.	<u>41 acres</u>
	<u>1,891 acres</u>



Irrigation has brought with it new industry and greater stability for the farmer. In southern Alberta farmers using the water of the St. Mary Project produce excellent crops of sugar beet. Ref. C228.

It is estimated that the St. Mary Project is half completed when considered in the light of capital expenditure. When finished it will serve 390,000 acres of new land between Lethbridge and Medicine Hat as well as supplying extra water for the 120,000 acres of the older, established districts.

In the agreement between the Government of Canada and the Government of Alberta it was decided that the major reservoirs and connecting canals be constructed and operated by the Government of Canada and all other canals, reservoirs and distributory systems be the responsibility of the Provincial Government.

In accordance with this agreement the Government of Canada has to date constructed the St. Mary Reservoir and the Pothole Coulee Reservoir while the Province has completed the Horsefly Lake, Taber Lake, Grassy Lake and Fincastle Lake Reservoirs.

During 1952 the work carried out under the agreement has consisted chiefly of constructing main canals and distribution ditches. (See map). Canada's share of this work has consisted of enlarging the capacity of the main canal running from Spring Coulee to the Pothole Coulee Dam. Originally capable of carrying 800 cubic feet per second this canal can now carry 3,300 cubic feet per second. Three further contracts for work on the main canal were completed on the section between the Pothole Coulee Dam and the Ridge Reservoir.

Alberta's share of the work includes all construction to the east of the Ridge Reservoir. From the Ridge Reservoir to Chin Reservoir seven contracts were completed, six of which were started in 1951.

At Chin Butte outlet works were completed for the enlargement of the Chin Reservoir.

Sixty-five miles of main canal between Chin Reservoir and Forty Mile Coulee just south of Bow Island were constructed with the exception of certain check and turnout structures.

A 2,640-foot syphon across Forty Mile Coulee was completed as well as all but three miles of the main canal between this point and Whitla.

In the Big Bend and Fincastle areas a contract was completed involving the digging of several miles of distribution ditches. This work added about 4,000 acres to the area already served in 1950 and brings the new total to 12,600 acres.

Started in 1951 the Grassy Lake Reservoir was finished this year along with its main connecting lateral serving tracts around Burdett and Grassy Lake. This lateral was syphoned across Yellow Lake Coulee south of Grassy Lake and distribution ditches were also constructed between Burdett and Grassy Lake.

Distribution systems, feeding 23,000 acres between Grassy Lake Reservoir and Forty Mile Syphon, were established this year. On the Bow Island tract distribution ditches were almost completed to serve a further 16,000 acres.

In all, ditches are now constructed to serve a total of approximately 54,000 acres of new land while the St. Mary Reservoir assures adequate supplies of water for the 120,000 acres in the older irrigation districts. It is expected that by 1955 most of the distribution system will be completed.

Expenditures from the inception of the project up to March 31, 1953 in accordance with the agreement are as follows:

Government of Canada (through P. F. R. A.)	\$12,501,018.00
Government of Alberta	\$ 8,800,000.00

(Note - The above figures may be subject to slight change).





While big dams impound thousands of acre feet of water it is the tiny check dams which finally turn the water onto the land. Irrigation comes to the Big Bend Tract on the St. Mary Project. Ref. C227.

#### SOUTH SASKATCHEWAN RIVER PROJECT

Survey work on the South Saskatchewan River Project was extended during the year to embrace a further 99,000 acres of irrigable area. Thirty-two thousand acres were mapped to a scale of 200 feet to the inch with two-foot contours and 67,000 acres were mapped to 400 feet to the inch with five-foot contours. In addition to these areas 15,800 acres were surveyed in the upper Qu'Appelle Valley to determine the feasibility of water storage in this region. Survey work was also completed in the vicinity of Buffalo Pound Lake in connection with the aerial mapping of that region. During the months of May and June one survey party was engaged full time at the Coteau Damsite producing a plane-table survey of 600 acres of river topography and other related surveys.

Further water levels, stream flow measurements and silt samples were taken on the South Saskatchewan River during the year.

Drilling and foundation investigations were carried out at the damsite utilizing both the churn drill and rotary drill. A further report on this work is included under the section on Soil Mechanics.

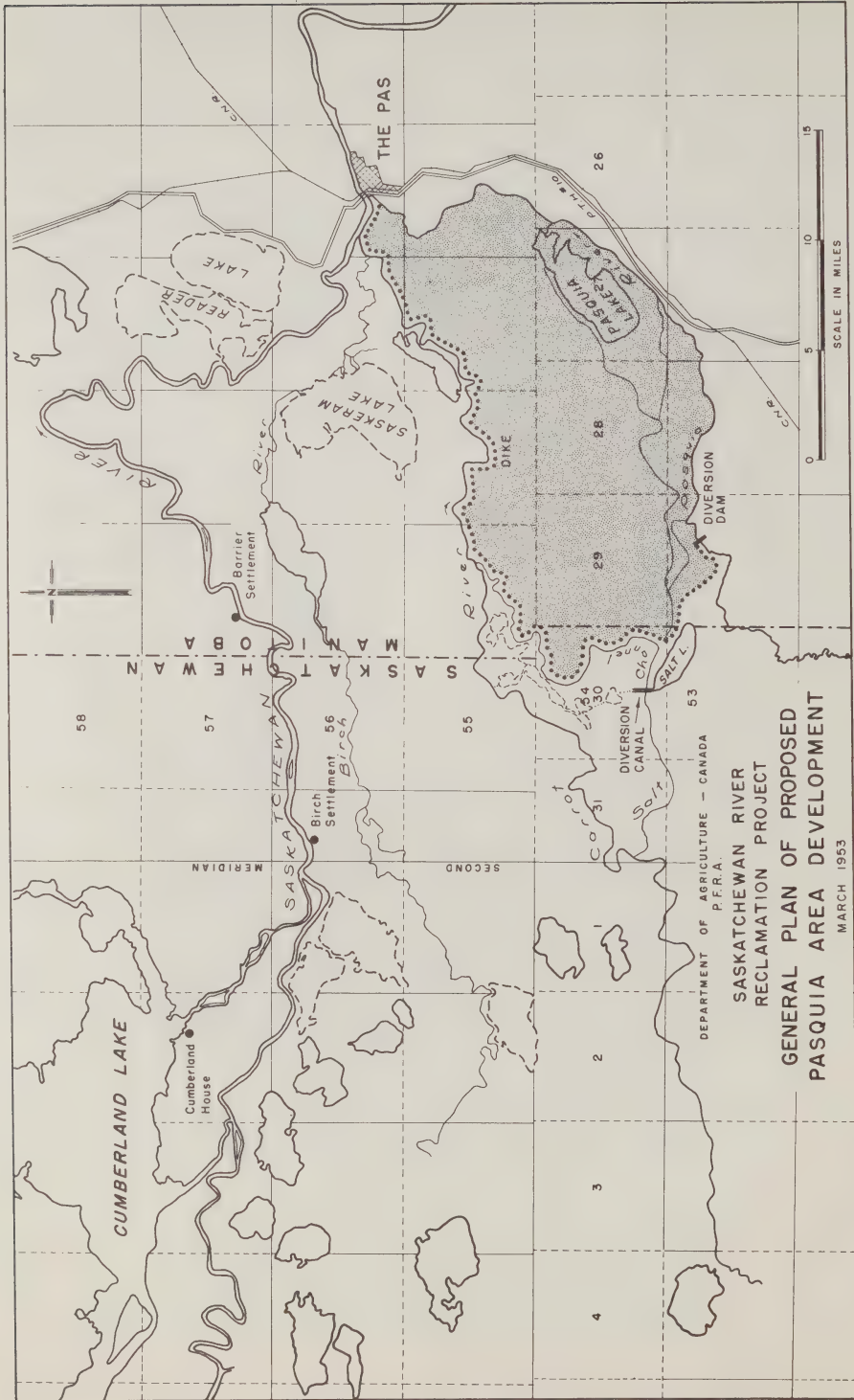
The P. F. R. A. placed all its information, relating to the South Saskatchewan River Project, before the Royal Commission for study.

### PASQUIA PROJECT

Investigations on the Pasquia area were continued through the fiscal year. Further surveys connected with diking along the banks of the Salt Channel and the Carrot River were carried out and in addition a diversion damsite was established on the Pasquia River. (see map). Only one survey party was engaged on this work.



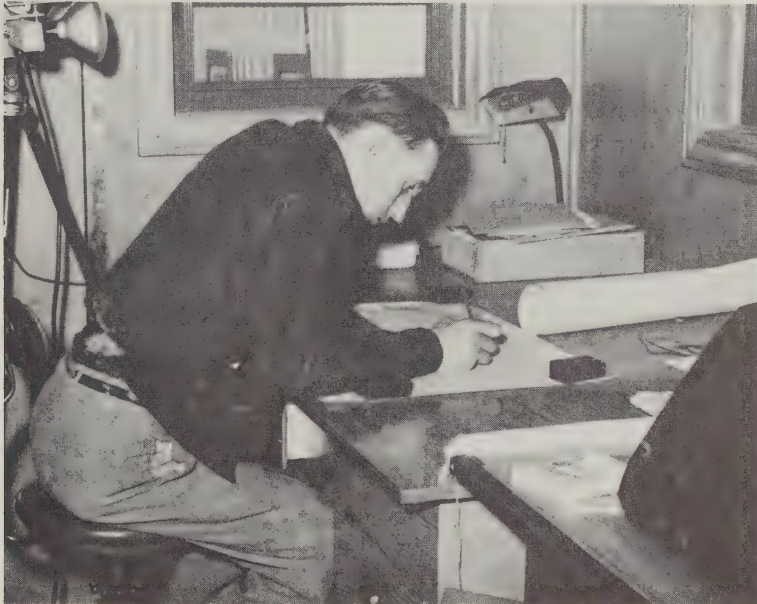
Surveying on the Pasquia Project is easiest done in the winter months when snowmobiles can traverse the frozen muskeg. A P. F. R. A. snowmobile carried a survey crew into the forest bordering the Pasquia River some thirty miles from The Pas, Manitoba. Ref. 712.





A Soil Mechanics survey party investigated sub-surface conditions along the proposed dike between the Pasquia Diversion Dam and the Carrot River plus the remainder of the Carrot River dike location which had not been explored previously.

An agreement has recently been reached between Canada and the Province of Manitoba concerning the Pasquia area and it is expected that construction of this section of the project will be carried on through 1953.

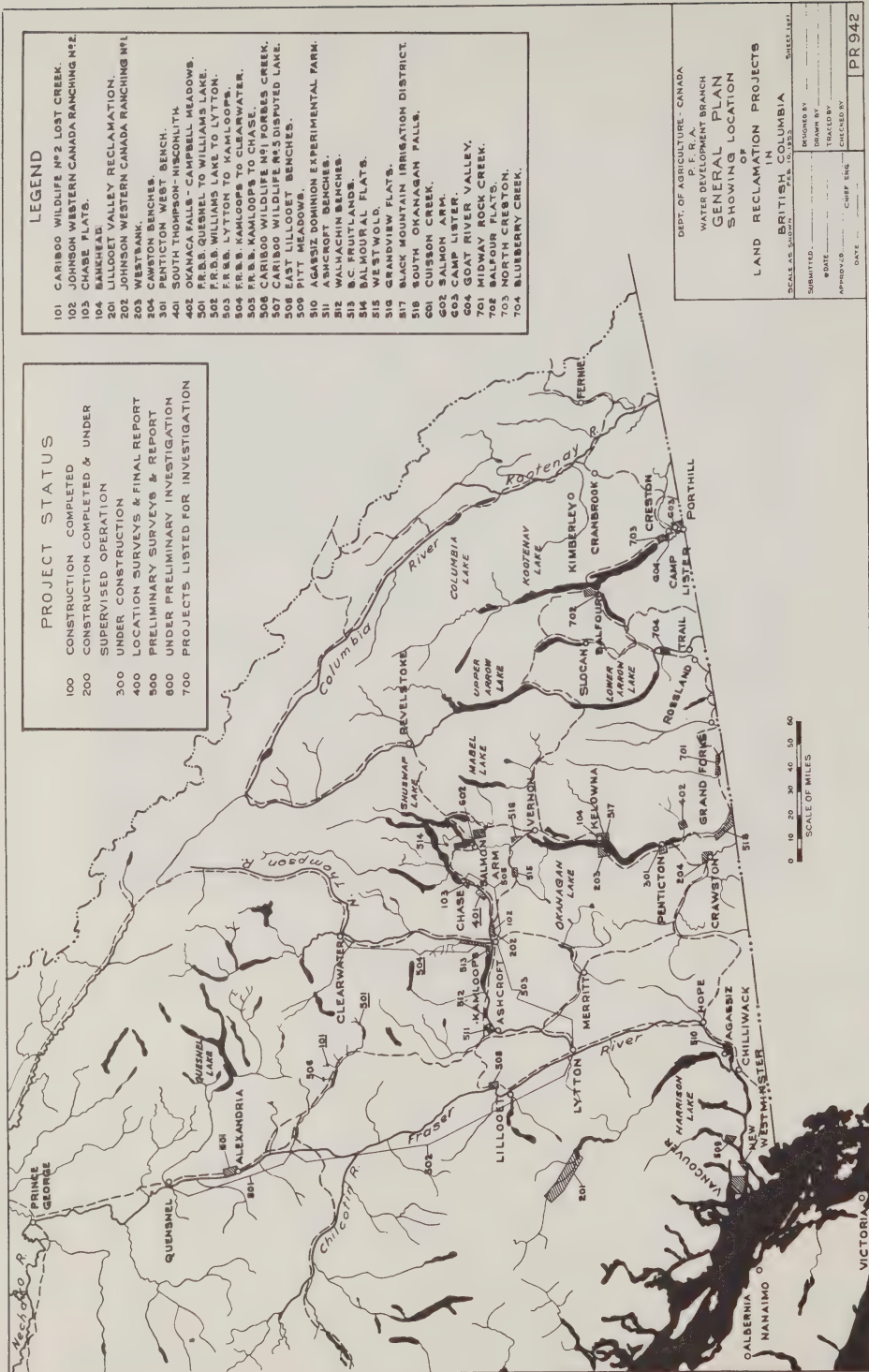


Surveying in the winter means isolation from normal drafting room facilities for months on end. In the P. F. R. A. mobile camp a small drafting table meets the immediate needs of the field men. Ref. 2222.

During the past season hydraulic investigations have been conducted along the Saskatchewan River and its tributaries within the reclamation area. The purpose of this investigation has been to determine the maximum river elevation at various locations under extreme flow conditions. This information in turn is of major importance in the proper planning of dike elevations throughout the whole project. During 1952 a hydrometric survey was carried out on the Saskatchewan, Carrot and Pasquia Rivers by a three-man party. Bench marks were established at all gauge locations and tied to geodetic datum.

During the winter 1952-53 an office study was commenced to determine the result of reclamation work along the Saskatchewan River.





## OTHER SPECIAL PROJECTS

### BRITISH COLUMBIA PROJECTS

The operation of P. F. R. A. in British Columbia in 1952-53 has been on a Special Project basis and has involved the temporary supervision of operation and maintenance on projects for the Veterans' Land Act which have already been constructed; the starting of one new project and an investigation of Special Projects proposed by the Government of British Columbia.

The work in British Columbia will be set out as follows:

- Projects under Construction.
- Projects under Operation and Maintenance.
- Projects under Investigation.

Supplementing this material is a key map (p. 50 ), showing the geographical location of all projects, either completed, under investigation or pending investigation.

Those projects under construction are as follows:

#### PENTICTON WEST BENCH

Located on a series of high bench lands directly west of Penticton this project consists of 94 holdings totalling 205.5 acres. The average holding is 2.2 acres and no holding is less than 1.6 arable acres. Careful study revealed that each holding had to be reduced to a minimum to keep operating costs within feasible limits for veteran settlers.

The project, commenced in December, 1952, consists of a pumping station installed on the Okanagan River capable of delivering water against a head of 450 feet in a closed pipe system. The project will provide both irrigation and domestic water.

It is expected that construction will be completed early in the fiscal year and that approximately 50 per cent of the area will be settled for the 1953 growing season.

Those projects under temporary operation and maintenance are as follows:

#### LILLOOET VALLEY RECLAMATION PROJECT

This is a diking and drainage project located in the Pemberton Valley some 100 miles from Vancouver on the Pacific Great Eastern Railway. The project will eventually protect 14,000 acres from flooding and reclaim new lands for settlement.

Work on the project commenced in the fall of 1946 and was practically completed by the spring of 1952. During the year assistance was rendered to the Pemberton Valley Diking District to complete certain phases of the project. The Diking District has assumed the responsibility for the operation and maintenance of the project for 1953. The P. F. R. A. is co-operating with the District for a year so that it can become firmly established in its plans for the future.



During the year this extension of a drainage lateral was constructed on one section of the Lillooet Valley Reclamation Project. Branch ditches such as this will reclaim sedge meadow and willow, and cottonwood swamps which will eventually be part of a 14,000-acre farm area. Ref. C229.

It is expected that the Provincial Government, which is administering settlement of Crown Lands in the project, will open up the first 500 acres of land for settlement in the spring of 1953.

Since protection and drainage have been provided in this region farmers are turning more to diversified farming. Dairying and livestock production are proceeding hand in hand with the growing of root crops, particularly seed potatoes, for which the area is famous.

## CHASE FLATS

Located near the town of Chase on the South Thompson River this project consists of 611 acres divided into 30-acre holdings. Water for this system is diverted from Chase Creek. Apart from some supervision and assistance in the adjustment of the control structures the Irrigation District carried out its own operations during the year.

## JOHNSTON -- WESTERN CANADA RANCHING NO. 1

This project, located six miles east of Kamloops, is also supplied with water pumped from the South Thompson River. Fifteen, ten-acre, full-time farms are served. During the season assistance was given to this District to realign trestle flumes and to carry out an experimental laying of asphaltic membrane in canals. Both these undertakings were necessary due to the low density soils and consequent high seepage and erosion rates. Results of these works will not be apparent until next year.

## WESTBANK IRRIGATION PROJECT

This project, consisting of 1,100 acres paralleling Okanagan Lake in the vicinity of Kelowna, is now operated by the Lakeview Irrigation District. Settlement of the farms is being continued by the Veterans' Land Act and about 60 per cent of the lands have been allotted. These lands consist of twelve-acre, full-time farms and three-acre small holdings.

Water for this sprinkler project is supplied from the Rose Valley Reservoir. This reservoir is also used for domestic supply and due to an undesirable quality developing in the water the P. F. R. A. gave engineering assistance to the Department of Public Health and the Veterans' Land Act in solving the difficulty. Individual chlorination units are being installed in the domestic supply line to each domicile and it is expected that in seven to nine years natural biochemical processes will have corrected the condition at the reservoir.

Active corrosion of the steel pipe in one area of the distribution system gave concern during the season. The uncommon nature of this type of corrosion and the preventive measures necessary, required that the P. F. R. A. undertake the design and installation of a cathodic protection system which arrested and, will in due course, overcome this problem.

## CAWSTON BENCHES

Operated by the Fairview Heights Irrigation District, the Cawston Benches Project is located south of Keremeos and covers 624 acres. Water is supplied by pumps from the Similkameen River in a closed pressure system for sprinkler irrigation.





On the Westbank Project in 1952 one area of the steel distribution system began to corrode. To effect repairs the pipeline was drained and the problem is now being solved by the installation of cathodic protection systems. An indication of the high pressure in the steel pipes is obtained from this view of the blow-off taken during the draining process. Ref. C225.

A silting basin was installed on this project as P. F. R. A. assistance. Aimed at reducing excessive wear in sprinkler heads this undertaking was completed late in the 1951-52 fiscal year and has operated satisfactorily this past year.

#### PROJECTS UNDER INVESTIGATION

Eight projects were under investigation during the year embracing irrigation, bank protection and the locating of a damsite.

Irrigation projects at Fruitlands, Grandview Flats, Camp Lister, Black Mountain, Cuisson Creek, Salmon Arm and North Creston were investigated and reported upon. These projects represent areas which the Province of British Columbia is interested in developing.

A preliminary survey and report was prepared on the lower portion of the Goat River where bank protection measures are required.

At the south end of Harrison Lake, as well as on the Harrison River, test drillings were made for the Fraser River Basin Board as part of an investigation into feasible damsites for flood control on the Fraser.

### MANITOBA PROJECTS

#### RIDING MOUNTAIN PROJECT

During the season the Riding Mountain area experienced good weather for both construction and surveying. Under an agreement between Canada and the Province of Manitoba extensive programs were carried out in both these fields.

Five survey crews stationed at Dauphin, Ste. Rose du Lac and McCreary concentrated on a topographic survey of the Turtle River and four of its tributaries. Construction work included operations on the Mink and Edwards Creeks and on the Wilson River and two of its tributaries.

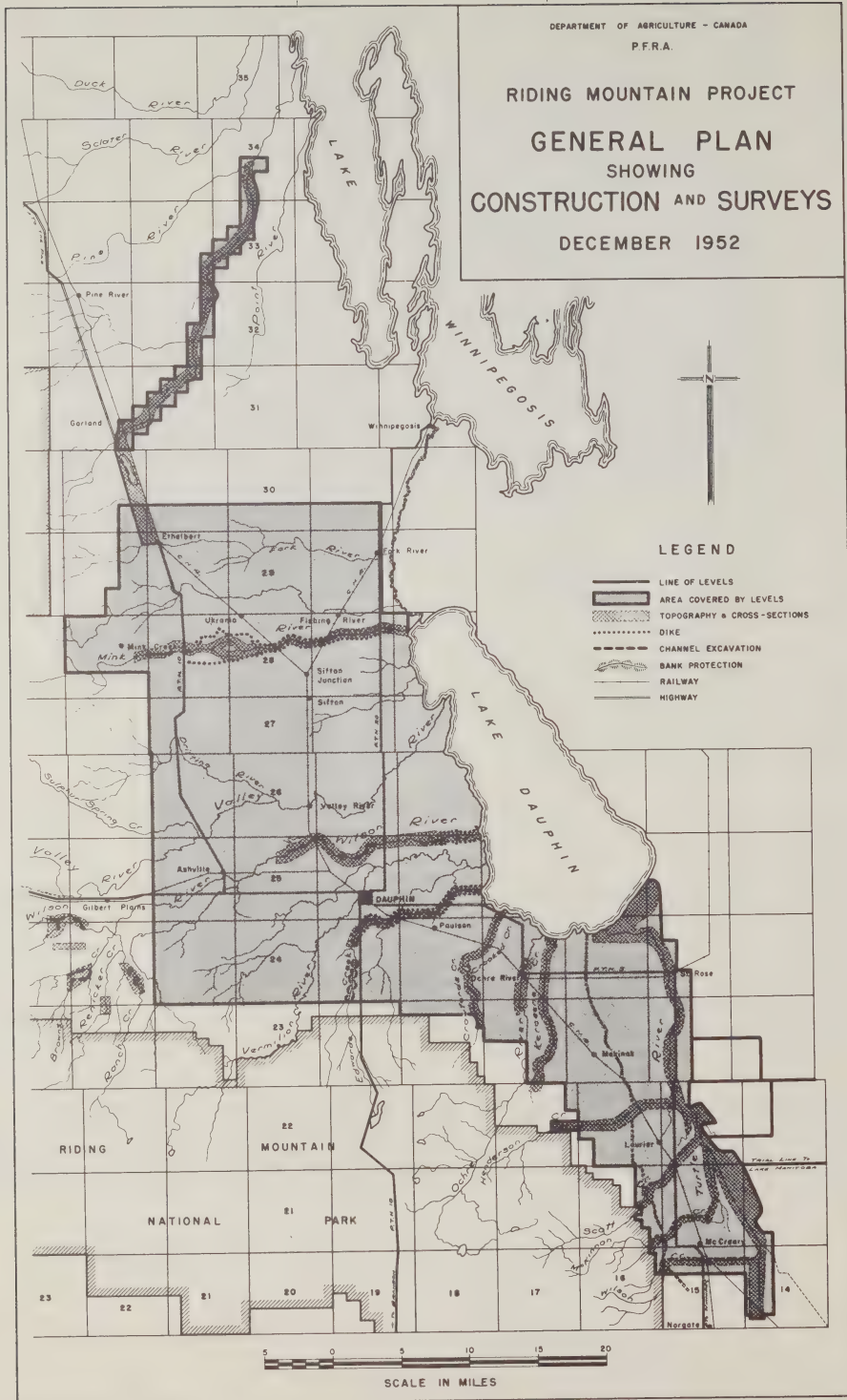
Surveys on streams arising on the eastern slopes of Riding Mountain covered the Wilson, McKinnon, Scott and Henderson Creeks as well as the Turtle River which conveys the water from the above streams to Dauphin Lake.

This season saw the completion of construction on the Edwards and Mink Creek projects which were commenced in the fall of 1949. New construction was started on the Wilson River and due to the fine weather and excellent soil conditions this project was largely completed by freeze-up.

The project is divided into two divisions; one in the Rural Municipality of Dauphin and the other in the Rural Municipality of Gilbert Plains.

In the Dauphin division, which includes a stretch of river from Dauphin Lake to a point ten miles to the west, approximately eight and one-half miles of diking was completed. Twenty-one cutoffs constructed by dragline were also completed in this region. In total, these cuts represent approximately three miles of ditch having a 30-foot bottom and a depth varying between eight and twelve feet. A further five cuts representing some 2,000 feet were constructed by bulldozers in the same area.

In the Gilbert Plains division two tributary streams of the Wilson River were dealt with as well as further improvements on the main stem. Work on the latter consisted of 2.6 miles of channel improvement leaving the stream with a 25-foot bed width.







A typical dragline cutoff on the Wilson River Section of the Riding Mountain Project. These cutoffs, along with strategically located dikes, will facilitate the rapid disposal of flood waters. Ref. 2606.



Four bulldozers work together in the construction of a relief cut on the Wilson River Section of the Riding Mountain Project, near Dauphin, Manitoba. Ref. 2617.



On Ranch Creek, one of the tributaries mentioned above, two miles of dike, six feet high, were built and ten small cutoffs were constructed to divert the stream away from this new work. The second tributary, Brown's Creek, has been straightened and enlarged for some two miles of its length.

## ASSINIBOINE RIVER PROJECT

### Basin Investigation

The investigation of the Assiniboine Basin, which was commenced in November, 1950, was finished at the end of the fiscal year and a comprehensive report thereon was submitted to the Government of Canada.

The object of the investigation was to study various engineering projects with the purpose of reducing flood hazards along the Assiniboine River, including Winnipeg City, and also of promoting low water control.

The most feasible plan for achieving these ends was found to be a combination of a main stem reservoir near Russell, Manitoba coupled with a diversion canal originating near Portage la Prairie. The latter was designed to conduct up to 10,000 c.f.s. of surplus flood waters from the Assiniboine north to Lake Manitoba. This solution had greater merit than any alternative scheme of diking or any project including diking along with other measures.

The investigation found that a well organized system of flood forecasting would be of very great value in the operation of the flood control project as a whole.

An estimate has been made of the benefits which will accrue if the proposed scheme is put into operation. Between Millwood and Portage la Prairie flood peaks would be reduced by an average of 10,000 c.f.s. while between Portage la Prairie and Winnipeg the reduction would be 18,000 c.f.s. At Winnipeg City itself, the flood peak of the Red River would be lowered by an average of 13,000 c.f.s. During a drought period, similar to that of the "thirties", the flow in the Assiniboine would be increased from a minimum of 150 c.f.s. to about 600 c.f.s.

### Diking

During 1952 approximately seven miles of diking was completed along the Assiniboine River. This represents a continuation of the diking work taken over from the Canada Department of Public Works in 1950. The entire existing diking system between Portage la Prairie and Winnipeg is in need of maintenance and this season's work has been aimed at those portions in greatest need of repair. In some cases it was necessary to construct new dikes on new locations. To eliminate possible erosion all dikes constructed have been seeded to grass at the expense of the municipalities involved.

## Gray's Cutoff, Brandon

An additional two and one-half feet was removed from this cut-off in the fall and an earth fill was thrown across the main channel of the Assiniboine to force the river through the new excavation.

# APPENDIX I

## Cumulative Statement

### Development and Operation of Community Pastures under the

#### Prairie Farm Rehabilitation Act

1938 to March 31, 1953

Fiscal Year	No. of Pasture Units in Operation	Area of Pastures in Operation (acres)	Total Cost of Construction of Pastures in Operation	Livestock Units Carried on Pastures x	Acres per unit of live stock	Cost of Operation		Net Operating Cost per Unit of Livestock	Average Charge per Unit Livestock to Farmers
						Revenue	Operating Costs		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,765,978.96	94,137	17.5	438,513.75	373,737.36	3.97	4.66
						2,477,382.26	2,042,134.76		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.

- A pasture unit may include one or more pastures, but it is operated under one management.

# APPENDIX II

P.F.R.A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1953.

Community Pasture and Headquarters	Area of Pasture Fenced (acres)	Cost of Construction to Date	Stock Pastured 1952-53	Cattle	Horses
<u>Pasture Operating Units - Saskatchewan</u>					
Coalfields #4, North Portal	25,440	108,516.98	1,394	100	
Esteven-Cambria #5 and 6, Esteven	6,720	14,349.95	547	13	
Masefield #17, Orkney	33,120	84,729.37	1,353	58	
Lone Tree #18, Bracken	32,480	65,110.46	2,232	83	
Battle Creek #20, Arena	65,760	104,202.98	1,959	22	
Nashlyn #21, Nashlyn	61,520	65,603.36	1,809	7	
Govenlock #22, Govenlock	66,560	77,845.98	1,713	-	
Lomond #37, pasture #1, Goodwater	23,200	49,785.66	1,166	101	
Lomond #37, pasture #3, Maxim	18,360	61,919.01	1,262	61	
Laurier #38, Lomond #2, Radville	36,800	84,027.79	2,278	192	
The Gap #39, Hardy	12,000	39,085.62	1,111	33	
Val Marie #47, Val Marie	155,680	222,783.39	4,857	18	
Beaver Valley #47A, Beaver Valley	11,360	23,956.95	625	-	
Reno #51, pasture #1, Robsart	16,160	31,004.33	946	17	
Reno #51, pasture #2, Consul	10,480	21,364.39	796	5	
Tecumseh #65, Forget	18,560	52,465.26	1,925	133	
Brokenshell #68, pasture #1, Trossachs	20,800	38,687.77	1,125	68	
Brokenshell #68, pasture #2, Clearfield	8,160	13,583.47	300	40	
Excel-Key West #70-71, Ormiston	31,200	78,260.59	2,106	146	
Auvergne-Wise Creek #76-77, Cadillac	40,640	101,589.73	2,744	26	
Wellington #97, Tyvan	25,920	78,713.39	2,645	132	
Caledonia-Elmsthorpe #99-100, Milestone	24,800	95,195.87	1,367	47	
Shamrock #134, Shamrock	26,000	40,871.66	2,014	26	
Swift Current-Webb #137-8, Beverley	18,880	68,660.84	1,679	21	
Gull Lake #139, Tompkins	8,960	2,263.32	-	-	
Big Stick #141, Golden Prairie	18,880	38,619.17	1,092	-	
Bitter Lake #142, Turnstall	33,760	66,914.60	1,510	26	
Spy Hill #152, Welby	20,000	46,430.62	1,162	56	
Elbow #223-4, Elbow	29,440	65,562.22	1,671	93	
Beaver Hills #245-6, Parkerview	44,160	99,912.14	2,895	251	
Coteau #255, Birsey	27,280	55,413.97	1,306	68	
Monet #257, Elrose	46,360	101,053.84	2,572	136	



Community Pasture and Headquarters	Area of Pasture Fenced (acres)	Cost of Construction to Date	Stock Pastured 1952-53 Cattle	Horses
Pasture Operating Units - Saskatchewan - Continued				
Newcombe #260, Glidden	52,800	113,413.71	1,481	107
Mantario #262, Empress, Alberta	24,480	57,607.94	738	8
Wreford #280, Hatfield	12,480	66,567.25	1,013	-
McCraney #282, Davidson	10,720	62,794.94	1,218	-
Rudy-Rosedale #283-284, Broderick	18,880	69,561.33	1,509	71
Hillsburgh #289, Brock	13,760	39,878.16	667	35
Eagle Lake #289-319, Netherhill	18,640	46,300.65	576	33
Kindersley-Elma #290-291, Kindersley	21,880	104,591.74	1,741	106
Usborne #310, Venn	12,720	30,799.46	924	38
Dundurn #314, Dundurn	20,640	34,911.13	1,300	-
Montrose #315, Donavon	20,480	48,581.68	1,506	-
Oakdale #320, Beaufield	20,480	59,554.58	1,014	67
Antelope Park #322, Hoosier	34,720	64,372.75	1,430	10
Wolverine #340, Plunkett	16,640	62,720.52	1,567	131
Mariposa #350, Kerrobert	27,680	84,449.13	1,771	114
Progress #351, Onward	19,800	60,769.01	1,356	45
Heart's Hill #352, Cactus Lake	15,160	28,094.31	1,102	45
Park #375, Langham	7,040	21,947.64	391	-
Battle River-Cut Knife #438-9, Gallivan	31,000	70,752.23	978	78
Royal #465, Marcelin	49,860	98,473.47	1,456	42
Paynton #470, Paynton	23,360	67,074.23	1,116	75
Totals for Saskatchewan	1,492,660	3,391,700.54	77,015	2,984

Community Pasture and Headquarters	Area of Pasture Fenced (acres)	Cost of Construc- tion to Date	Stock Pastured 1952-53 Cattle      Horses
Totals for Saskatchewan (carried forward)	1,492,660	3,391,700.54	77,015      2,984
Pasture Operating Units - Manitoba			
Archie Pasture - McAuley	40,320	83,607.19	1,579      86
Ellice Pasture - Lazare	20,320	27,614.80	1,161      56
Portage Pasture - Poplar Point	14,640	39,118.24	2,656      75
Woodlands Pasture - Poplar Point	20,960	57,501.02	2,486      313
Lakeview Pasture - Langruth	29,280	72,105.40	2,495      23
Westbourne Pasture - Gladstone	11,520	35,669.34	1,333      33
Langford Pasture - Neepawa	19,040	58,662.43	1,785      57
Wallace Pasture - Elkhorn	3,280	(Operated by Wallace R.M.)	
Totals for Manitoba	159,360	374,278.42	15,495      643
GRAND TOTALS	1,652,020	3,765,978.96	90,510      3,627

# APPENDIX III

## PRAIRIE FARM REHABILITATION ACT

showing number of projects and amount of financial assistance paid since the inauguration of program to

March 31, 1953

Province & Classification	DUGOUTS		STOCKWATERING DAMS		IRRIGATION SCHEMES		TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
<u>MANITOBA</u>								
Individual	9,832	964,914.64	292	21,241.70	96	26,120.05	10,220	1,012,276.39
Neigh. & Comm.	39	7,356.64	26	20,449.43	4	1,060.15	69	28,866.22
Total	9,871	972,271.28	318	41,691.13	100	27,180.20	10,289	1,041,142.61
<u>SASKATCHEWAN</u>								
Individual	26,451	2,933,390.31	3,708	314,484.20	1,691	394,535.34	31,850	3,642,409.85
Neigh. & Comm.	401	169,534.36	138	98,091.48	61	25,392.38	600	293,018.39
Total	26,852	3,102,924.67	3,846	412,575.68	1,752	419,927.72	32,450	3,935,428.07
<u>ALBERTA</u>								
Individual	2,794	289,412.55	1,871	171,775.29	834	192,159.58	5,499	653,347.42
Neigh. & Comm.	27	7,729.34	42	27,018.37	17	12,275.89	86	47,023.60
Total	2,821	297,141.89	1,913	198,793.66	851	204,435.47	5,585	700,371.02
<u>GRAND TOTAL</u>								
	39,544	4,372,337.84	6,077	653,060.47	2,703	651,543.39	48,324	5,676,941.70

APPENDIX IV

Progress by Years in the Construction of Small Projects  
P.F.R.A. Water Development Program  
1935 to March 31, 1953.

Number of Projects Constructed				Financial Assistance Paid on Projects				
Fiscal Year	(1) DO	SWD	Irr	Total	DO	SWD	Irr	Total
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	473	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08
1952-53 (est.)	1,207	178	335	1,720	141,181.96	20,175.25	104,218.74	265,575.95
TOTAL	39,544	6,077	2,703	48,324	4,372,337.84	653,060.47	651,543.39	5,676,941.70

(1) DO - Dugout      SWD - Stockwatering Dam      Irr - Individual Irrigation Project



# APPENDIX V

## WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS

To March 31, 1953.

### MANITOBA

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Crystal City Storage	1	Crystal City	Stockwatering	1935	---	3	3,334.00
R. M. of Edwards	2	Melita	"	1935	---	100	10,214.00
Town of Souris	3	Souris	"	1935	---	150	3,841.00
Clear Water Storage	4	Clear Water	"	1938	---	12	5,949.00
Brandon Water Supply	5	Brandon	Storage	1940	---	500	3,996.00
Morris River-Rock Lake	6	Carman	Stockwatering	1940	---	10,000	23,401.00
Dead Horse Creek Dam	7	Morden	Irr. & Stockwatering	1941	100	1,200	49,891.00
La Salle River Dams	8	La Salle	Stockwatering	1941	---	900	22,989.00
Hartney	9	Hartney	Irr. & Stockwatering	1941)	---	---	10,264.00
Melita	10	Melita	" "	1941)	3,900	3,200	(11,372.00
Napinka	11	Napinka	" "	1941)	---	---	( 6,770.00
Wawanesa	12	Wawanesa	" "	1941)	---	---	15,457.00
Whitemud River Storage	13	Gladstone	Stockwatering	1943	---	660	11,464.00
Alexander Soil Conservation	14	Alexander	Soil Conservation	1944	---	---	5,250.00
Little Souris River Dam	15	Melita	Stockwatering	1945	---	250	1,380.00
Birtle Dam	16	Birtle	Stockwatering	1947	---	---	11,490.00
R. M. of Westbourne	17	Gladstone	"	1947	---	---	5,993.00
Rosebank Dam	18	Rosebank	Stockwatering	1948	---	32	12,161.00
Shoal Lake Project	19	Shoal Lake	"	1948	---	3,500	8,491.00
St. Lazarre Storage Res.	20	Lazarre	"	1948	---	5	1,470.00
Brandon Flood Irr.	21	Brandon	Flood Irrigation	1949	1,000	---	27,107.00
Whitemud River	22	Woodside	Stockwatering	1949	---	160	6,506.00

<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Dead Lake Community Minnedosa Dam	23 24	Gladstone Minnedosa	Irr. & Stockwatering Storage	1950 1950	20 20	90 1,500	1,933.00 105,051.00
Wawanesa	12	Wawanesa	Irr. & Stockwatering	1952	---	---	109,875.00
Town of Souris	3	Souris	Stockwatering	Incomplete	---	---	72,996.00
Dead Horse Creek	7	Morden	Irr. & Stockwatering	Incomplete	---	---	36,997.00
<u>SASKATCHEWAN</u>							
Adams Lake	1	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
Lajord	2	Lajord	Flood Control	1936	---	300	13,800.00
Val Marie	3	Val Marie	Irrigation	1937	5,500	7,000	214,558.00
Middle Creek	4	Battle Creek	"	1937	1,000	20,000	18,663.00
Davidson	5	Davidson	Irr. & Stockwatering	1937	100	277	3,114.00
Dunn & Watt	6	Mankota	Irrigation	1937	305	---	2,996.00
Moose Mountain	7	Corning	"	1937	---	8,000	14,829.00
Girvin	8	Girvin	Stockwatering	1937	---	19	2,180.00
Lac Pelletier	9	Lac Pelletier	"	1937	---	3,350	2,139.00
McCraney, R. M. of	10	Kenaston	"	1937	---	350	1,896.00
Roughbark Creek	11	Goodwater	"	1937	---	1,500	9,314.00
Maple Creek	12	Maple Creek	Irr. & Stockwatering	1938	4,500	23,260	356,179.00
Moose Jaw Creek	13	Lang	Irrigation	1938	2,250	2,180	7,618.00
Lake of the Rivers	14	Assiniboia	Stockwatering	1938	---	300	10,805.00
Long Creek #1	15	Estevan	"	1938	---	137	8,729.00
Long Creek #2	16	Estevan	"	1938	---	90	8,701.00
Masefield	17	Masefield	"	1938	---	40	3,187.00
Pipestone Lake	18	Broadview	"	1938	---	1,600	11,785.00
Eastend	19	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Cypress Storage	20	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
Big Arm Storage	21	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Kisbey Flats	22	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
Arcola	23	Arcola	Stockwatering	1939	---	Under- ground	17,310.00

<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Val Marie West	24	Val Marie	Irrigation	1940	3,500	2,000	150,639.00
Lafleche	25	Lafleche	Stockwatering	1940	---	38	2,525.00
Saskatoon	26	Saskatoon	Storage	1940	---	1,200	290,446.00
Weyburn	27	Weyburn	Flood Irrigation	1940	---	4,000	51,311.00
Buffalo Pound	28	Qu'Appelle Valley	Irrigation	1940	*	---	83,723.00
Battleford	29	North Battleford	Irrigation (Pump)	1941	800	---	3,058.00
Dead Lake	30	Macoun	Irr. & Stockwatering	1941	Souris River Development	---	(17,528.00
Oxbow	31	Oxbow	" " "	1941	3,900	3,200	(17,436.00
Souris-Estevan	32	Estevan	" " "	1941	---	---	(91,133.00
Canora	33	Canora	Storage	1941	---	300	16,128.00
Crooked & Round Lake	34	Qu'Appelle Valley	Irrigation	1941	*	---	48,650.00
Fairhill	35	" "	" "	1941	*	---	4,302.00
Lebret	36	" "	" "	1941	*	---	16,307.00
Last Mountain Lake	37	" "	" "	1941	*	---	42,271.00
Tantallon	38	Tantallon	Stockwatering	1942	---	---	2,790.00
Wood River Development	39	Coderre and Gravelbourg	" "	1942	---	4,923	33,738.00
Jackfish Creek	40	Meota	Stockwatering	1943	---	90	2,940.00
Craven Dam	41	Qu'Appelle Valley	Irrigation	1943	*	---	33,675.00
Echo Lake	42	" "	" "	1943	*	---	41,753.00
Caron Water Development	43	Thunder Creek	Stor. & Stockwatering	1944	---	43,500	701,433.00
Cadillac	44	Cadillac	Irr. & Stockwatering	1945	800	1,350	32,887.00
Wolverine Creek	45	Humboldt	Stockwatering	1945	---	522	52,600.00
Loon Creek	46	Markinch	" "	1945	---	700	7,180.00
Richardson-McKinnon	47	Consul	Irrigation	1946	3,000	---	53,913.00
Swift Current	48	Swift Current	Irr. & Stockwatering	1946	30,000	95,000	748,906.00
Beechy #1	49	Beechy	" " "	1946	600	1,000	12,746.00
Matador	50	Matador	" " "	1946	120	220	5,216.00
Bracken	51	Bracken	Stockwatering	1946	---	158	1,001.00

\* - Ultimate irrigation development for all projects along Qu'Appelle River Valley - 30,000. (Total storage capacity - 95,600 acre feet.)

<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acres</u>	<u>Costs</u>
Eagle Hill Creek	52	Plenty	Stockwatering	1946	---	10,700	6,432.00
Hanley	53	Hanley	"	1946	---	60	3,797.00
Lucky Lake	54	Lucky Lake	"	1946	---	120	7,596.00
Frenchville	55	Frenchville	Irr. & Stockwatering	1947	430	670	8,096.00
Gravelbourg Storage	56	Gravelbourg	Irrigation	1947	500	---	1,917.00
Coronach	57	Coronach	Irr. & Stockwatering	1947	300	1,450	10,990.00
Wittrock	58	Frenchville	Irrigation	1947	520	---	3,884.00
Cedoux	59	Cedoux	Stockwatering	1947	---	314	4,999.00
Davin	60	Kronau	"	1947	---	1,080	13,501.00
Jumping Deer Creek	61	Lipton	"	1947	---	145	6,092.00
Kaposvar	62	Stockholm	"	1947	---	290	11,946.00
Kelfield	63	Kelfield	"	1947	---	25	4,927.00
Radville	64	Radville	"	1947	---	32	5,019.00
Shrimp Lake	65	Herschel	"	1947	---	450	9,367.00
Tyvan	66	Tyvan	"	1947	---	1,000	11,986.00
Wynyard	67	Wynyard	"	1947	---	35	6,225.00
Spangler Project	68	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Gravelbourg South	69	Gravelbourg	"	1948	600	1,500	8,186.00
Beechy #2	70	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Marsh Flood Irrigation	71	Cedoux	Irrigation	1948	400	---	1,765.00
Pike Lake	72	Vanscoy	Irr. & Stockwatering	1948	900	2,500	7,360.00
Rosedale	73	Hanley	Irrigation	1948	60	100	1,016.00
Sherwood	74	Regina	Dugout (Irrigation)	1948	20	3	697.00
Talmage	75	Cedoux	Irrigation	1948	1,600	---	3,483.00
Allan	76	Allan	Stockwatering	1948	---	300	4,477.00
Boharm	77	Boharm	"	1948	---	100	6,250.00
Balcarres	78	Balcarres	"	1948	---	100	7,203.00
Cabri	79	Cabri	"	1948	---	340	37,553.00
Gooseberry Lake	80	Corning	"	1948	---	2,500	8,783.00
Glenside	81	Glenside	"	1948	---	150	3,286.00
Mine Coulee	82	Neptune	"	1948	---	40	4,377.00
North Qu'Appelle	83	Fort Qu'Appelle	"	1948	---	100	2,386.00
Fasqua	84	Moose Jaw	"	1948	---	40	3,777.00
Stephens	85	Abernethy	"	1948	---	12	8,716.00
Wolseley	86	Wolseley	"	1948	---	20	1,800.00
Young	87	Young	"	1948	---	250	8,892.00



<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Acre Feet</u>	<u>Stor. Cap.</u>	<u>Costs</u>
Caron	88	Caron	Storage	1948	---	100		17,109.00
Thunder Creek	89	Kettlehut	Flood Irrigation	1948	---	---		27,204.00
Souris River	90	Weyburn	Flood Control	1948	---	---		11,998.00
Admiral Storage Dam	91	Admiral	Irr. & Stockwatering	1949	2,000	2,200		38,520.00
Bateman	92	Gravelbourg	" " "	1949	400	114		4,739.00
Sumnercove	93	Mankota	" " "	1949	1,200	1,500		23,837.00
Scotsguard	94	Scotsguard	" " "	1949	2,000	3,000		1,962.00
Woodrow-Pinto Creek	95	Woodrow	Irrigation	1949	1,000	1,400		41,982.00
Arena	96	Arena	Irr. & Stockwatering	1949	1,600	3,200		5,218.00
Dummer	97	Milestone	" " "	1949	500	200		4,742.00
Eagle Lake	98	Coleville	" " "	1949	2,000	3,000		1,920.00
Frenchman Flats	99	Dundurn	Irrigation	1949	1,800	2,800		9,996.00
Langenburg	100	Langenburg	Irr. & Stockwatering	1949	800	200		11,752.00
Lonsome Lake	101	Vidora	Irrigation	1949	900	800		2,771.00
Muenster	102	Muenster	" " "	1949	25	11		2,754.00
McIntosh Slough	103	Golden Prairie	" " "	1949	500	1,500		1,990.00
Richman Irrigation	104	Glen Bain	" " "	1949	---	1,000		4,607.00
Reciprocity	105	Glen Ewen	Irr. & Stockwatering	1949	2,000	1,750		27,410.00
Summit Creek	106	Bridgeford	" " "	1949	800	3,000		13,227.00
Sauder	107	Rush Lake	Storage-Irrigation	1949	---	800		29,115.00
Shaheen	108	Rush Lake	" " "	1949	---	300		9,028.00
Valley Park Irrigation	109	Valley Park	Irrigation	1949	1,200	---		8,133.00
West Osage	110	Cedoux	Irr. & Stockwatering	1949	300	600		4,905.00
Beadle	111	Beadle	Stockwatering	1949	---	2		997.00
Brook Community	112	Brook	" " "	1949	---	2		951.00
Caron Community Dam	113	Caron	" " "	1949	---	4		697.00
Cactus Lake	114	Cactus Lake	" " "	1949	---	2		730.00
Chapleau Lake	115	Montmartre	" " "	1949	---	3,530		8,208.00
Dry Lake	116	Forward	" " "	1949	---	600		9,729.00
Eastview	117	Pense	" " "	1949	---	200		5,970.00
Edenwold	118	Balgonie	" " "	1949	---	400		15,599.00
Elfros	119	Elfros	" " "	1949	---	25		7,321.00
Eatonia	120	Eatonia	" " "	1949	---	12		1,199.00
Hodgeville	121	Hodgeville	" " "	1949	---	5		2,748.00
Kindersley	122	Kindersley	" " "	1949	---	300		2,007.00
Kincaid	123	Kincaid	" " "	1949	---	10		2,539.00
Maxim Lake	124	Maxim	" " "	1949	---	5,000		20,472.00
Meeting Lake	125	Redfield	" " "	1949	---	100		2,683.00

Ref.	Name of Project	No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acres	Costs
126	Monet		Hughton	Stockwatering	1949	---	10	878.00
127	Mossbank		Mossbank	"	1949	---	2	875.00
128	Nemnon		Waldheim	"	1949	---	2	976.00
129	Prairie Dale		Superb	"	1949	---	2	987.00
130	Snipe Lake		Eston	"	1949	---	---	3,415.00
131	Sioux Reserve		Fort Qu'Appelle	"	1949	---	75	8,605.00
132	Truax Dam		Truax	"	1949	---	250	11,899.00
133	Camberly		Camberly	Irr. & Stockwatering	1950	200	100	2,106.00
134	Poplar River		Coronach	" "	1950	300	900	14,838.00
135	Baldon & Tilney		Baldon	Stockwatering	1950	---	4	780.00
136	Cutknife		Cutknife	"	1950	---	5	280.00
137	Crane Valley		Viceroy	"	1950	---	2	599.00
138	Delisle		Delisle	"	1950	---	45	4,899.00
139	East Borden		Borden	"	1950	---	60	526.00
140	Elrose		Elrose	"	1950	---	5	999.00
141	Fleming		Moosomin	"	1950	---	75	3,282.00
142	Fielding		Playmont	"	1950	---	50	918.00
143	Hague Dugout		Hague	"	1950	---	2	1,000.00
144	Stewart Valley Dugout		Stewart Valley	"	1950	---	3	799.00
145	Sturgis Community Dam		Sturgis	"	1950	---	60	20,961.00
146	Viceroy		Viceroy	"	1950	---	3	798.00
147	Readlyn		Readlyn	"	1950	---	3	800.00
148	Round Hill Water Users		North Battleford	Irr. & Stockwatering	1950	425	50	4,791.00
149	Melavel		Melavel	Stockwatering	1950	---	18	1,200.00
150	Mankota Dam		Mankota	"	1950	---	10	950.00
151	McDonald Creek		McCord	Irr. & Stockwatering	1950	400	90	4,992.00
152	Tribune Dam		Tribune	Stockwatering	1950	---	300	6,499.00
153	Bright Water Creek		Hanley	Irrigation	1950	2,500	3,500	858.00
154	Consul-Vidora		Vidora	"	1950	3,000	---	62,500.00
155	Alticane		Richard	Stockwatering	1951	---	2.5	858.00
156	Beaver Creek		Hanley	"	1951	---	200	7,998.00
157	Clearfield		Goodwater	Irr. & Stockwatering	1951	70	300	5,999.00
158	Dalmeny		Dalmeny	Stockwatering	1951	---	3	1,000.00
159	Dunnil		Macklin	"	1951	---	2	975.00
160	Dunning		Radville	Irrigation	1951	120	200	3,566.00
161	Reford		Wilkie	Stockwatering	1951	---	160	1,814.00
162	Reward		Reward	"	1951	---	---	921.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Russell Creek	163	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
Salvador	164	Reward	Stockwatering	1951	---	5	1,000.00
Smiley	165	Smiley	Irr. & Stockwatering	1951	600	300	9,998.00
Thunder Creek Channel	166	Moose Jaw	" "	1951	300	7,000	10,007.00
Wheatlands, R. M. of	167	Parkbeg	" "	1951	100	60	3,452.00
Wood Mountain	168	Willowbunch	" "	1951	40	60	6,337.00
Braddock Dam	169	Braddock	Irrigation	1952	2,000	1,500	83,999.00
Newburn Lake	170	Invermay	Irr. & Stockwatering	1952	50	1,280	6,477.00
Terrell, R. M. of	171	Spring Valley	Stockwatering	1952	---	10	2,491.00
Gouverneur Dam	172	Ponteix	Irrigation	1952	6,000	10,000	239,982.00
Eagle Lake	98	Coleville	Irr. & Stockwatering	1952	2,000	3,000	4,078.00
Ceylon Reservoir		Ceylon	Irr. & Stockwatering	Incomplete	300	250	6,396.00
Doonside Dam		Wawota	Irrigation	Incomplete	1,500	1,500	1,307.00
Elfros		Foam Lake	Stockwatering	Incomplete	---	900	1,990.00
Macklin Storage		Macklin	" "	Incomplete	---	40	967.00
North Herbert Extension		Herbert	Irrigation	Incomplete	---	---	511,909.00
West Poplar #1		Kildeer	" "	Incomplete	750	1,000	4,460.00
Gibson Flats		Pennant	" "	Incomplete	1,200	---	9,165.00
<u>ALBERTA</u>							
Canada Land and Irrigation Project	x 1	Medicine Hat	Irrigation	1936	45,000	---	80,000.00
Mountain View	2	Mountain View	Storage	1936	---	4,200	3,000.00
Wildhorse Storage	3	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Eastern Irr. District	x 4	Brooks	Irrigation	1937	2,280	22,000	22,490.00
Rolling Hills	x 5	Rolling Hills	Irrigation	1938	25,000	---	46,839.00
Magrath	x 6	Magrath	Irrigation	1939	4,955	---	2,756.00
Leavitt Irrigation	x 7	Mountain View	" "	1939	7,000	7,050	65,578.00
x -		P.F.R.A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.					

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Acre Feet	Stor. Cap.	Costs
Atlee Gas Well #1	8	Atlee	Irrigation (pump)	1939	7,000	---	---	12,423.00
Atlee Gas Well #2	8A	Atlee	"	--	---	---	---	14,300.00
Bull Pound Creek	9	Hanna	Stockwatering	1939	---	2,000	---	---
Bullshead Creek	10	Medicine Hat	Irr. & Stockwatering	1940	800	1,130	---	8,170.00
Raymond	x 11	Raymond	Irrigation	1943	3,000	1,600	---	6,000.00
Bartman Dam	12	Cessford	Irr. & Stockwatering	1943	1,000	3,000	---	49,100.00
Graham Creek	13	Calgary	Stockwatering	1943	---	230	---	8,529.00
Seven Persons	14	Seven Persons	"	1943	---	800	---	12,103.00
Aetna Irr. District	15	Aetna	Irrigation	1947	8,000	---	---	82,004.00
Pothole Coulee	16	Magrath	Irrigation	1948	(Part of St. Mary Project)	---	---	---
Berry Creek	17	Carolside	"	1948	10,000	30,000	---	158,884.00
North Fincastle	18	Taber	Irr. & Stockwatering	1948	2,000	4,000	---	17,943.00
South Macleod	19	Macleod	Irrigation	1948	6,000	---	---	82,614.00
Badger Lake	20	Lomond	Stockwatering	1948	---	10	---	2,990.00
Clear Lake	21	High River	"	1948	---	10,000	---	35,000.00
Franklin Coulee	22	Retlaw	"	1948	---	1,500	---	20,125.00
Hanna	23	Hanna	"	1948	---	500	---	29,498.00
Three Hills	24	Three Hills	"	1948	---	120	---	19,652.00
Vauxhall	25	Vauxhall	"	1948	---	30	---	5,883.00
Bell Lake	26	Pollockville	Irrigation	1949	700	1,500	---	4,738.00
Brunswick Coulee	27	Enchant	"	1949	500	205	---	4,631.00
Dead Fish Creek	28	Cessford	"	1949	4,000	5,000	---	47,832.00
Eureka Irrigation Project	29	Grassy Lake	"	1949	12,000	1,000	---	38,568.00
East Berry Creek	30	Rose Lynn	"	1949	1,500	750	---	9,677.00
Sounding Creek	31	Cereal	"	1949	8,000	5,600	---	51,988.00
Squaw Coulee	32	High River	"	1949	2,000	455	---	17,999.00
Serviceberry Creek	33	Near Drumheller	"	1949	1,200	500	---	17,518.00
Argyle, M. D. of	34	Stavelly	Stockwatering	1949	---	80	---	10,912.00
C. Y. Water Users	35	Taber	"	1949	---	310	---	16,477.00

x - P.F.R.A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.



<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Snake Creek	36	Calgary	Irr. & Stockwatering	1950	500	300	15,976.00
Severn Creek	37	Rosebud	" "	1950	1,000	1,000	24,990.00
Bare Creek	38	Comrey	" "	1950	---	500	11,600.00
Ross Creek	39	Irvine	Irrigation	1950	3,000	5,000	47,998.00
Wheatacre Dam	40	Rockyford	" "	1950	1,600	1,500	12,976.00
Wintering Hills	41	Hussar	" "	1950	1,000	500	9,993.00
Beaverdam Creek Reservoir	42	Castor	Stockwatering	1950	---	300	17,996.00
Ross Lake Comm.	43	Raymond	" "	1950	---	300	7,987.00
Lake Beauvais	44	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Loyalist Creek	45	Hanna	" "	1950	2,000	1,400	14,993.00
Irvine	46	Irvine	Irr. & Stockwatering	1950	70	100	4,799.00
Ambrose Flats	47	Irvine	Irrigation	1951	800	1,000	4,781.00
McAlpine Reservoir	48	Walsh	" "	1951	600	1,000	15,917.00
McGregor Dam	49	Vulcan	" "	1951	1,500	700	9,473.00
Pirmez Creek	50	Pirmez Creek	" "	1951	6,000	500	20,998.00
Pershing Dam	51	Glenwood	" "	1951	100	200	4,782.00
Vulcan Dam	52	Vulcan	" "	1951	400	150	3,997.00
Reid Hill	53	Vulcan	Irrigation	1952	1,000	700	8,866.00
Wheatacre #2	54	Rockyford	" "	1952	---	---	4,744.00
Esther Flood Irrigation	55	Macklin	" "	1952	4,000	5,000	4,592.00
Mackay Dam	56	Walsh	" "	1952	600	300	9,600.00
Meadow Creek Dam	57	Clareholm	" "	1952	1,500	---	5,630.00
Cowley Community	58	Cowley	" "	1952	750	---	4,666.00
Rough Meadow Reservoir		Coronation	Irrigation	Incomplete	3,200	---	2,471.00

# MAJOR PROJECTS - IRRIGATION RECLAMATION

(Special Projects Not Directly Under P.F.R.A. Appropriation Vote)

To March 31, 1953

<u>Name of Project</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
<u>MANTOBA</u>						
Assiniboine River Dyking & Cut-off	Brandon	River Control	Incomplete	---	---	51,797
Riding Mountain	Dauphin	Drainage	Incomplete	---	---	541,037
Saskatchewan River Reclam- ation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	---	34,723
<u>ALBERTA</u>						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
(a) Purchase of Canada Land & Irrigation Company						2,353,182
(b) Development & Construction	Lethbridge	Irrigation	Incomplete	519,000	320,000	8,160,794
St. Mary	Lethbridge	Irrigation	1950	---	---	7,705,686
Belly River Diversion						53,901
<u>BRITISH COLUMBIA</u>						
Cawston Benches	Kerameos	Irrigation (Pump)	1951	629	2,000	178,797
Chase & Johnston-Western Canada Ranching	Kamloops	Irrigation	1951	755	---	120,366
Western Canada Ranching #2	Kamloops	Irrigation (Pump)	1950	54	---	9,737
Lillooet-Pemberton	Pemberton	River Control	Incomplete	---	---	1,033,567
South Thompson-Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	526,205
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	---	32,229
Penticton West Bench	Penticton	Irrigation (Pump)	Incomplete	800	---	47,000

(Above includes only Construction Costs)

# APPENDIX VII

## PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

April 1, 1935 - March 31, 1953

	<u>1935 - 1952</u>	<u>1952 - 1953</u>	<u>Total</u>
<u>ADMINISTRATION</u>			
Ottawa Administration	181,005	21,895	202,900
Regina Administration	813,855	75,949	889,804
Total	<u>994,860</u>	<u>97,844</u>	<u>1,092,704</u>
<u>EQUIPMENT</u>			
Purchase of Equipment	350,144	182,971	533,115
Upkeep of Equipment	281,700	116,467	398,167
Equipment Depot	756,127	134,940	891,067
Total	<u>1,387,971</u>	<u>434,378</u>	<u>1,822,349</u>
<u>LAND UTILIZATION</u>			
Supervision	425,874	40,708	466,582
Construction of Community Pastures	4,650,254	295,457	4,945,711
Pasture Improvements	41,349	11,112	52,461
Operation of Community Pastures	1,893,449	423,732	2,317,181
Purchase of Bulls	327,625	50,804	378,429
Re-establishment of Farmers	---	---	---
Grass Seeding & Experimental Regrassing	472,560	13,279	485,839
Total	<u>7,811,111</u>	<u>835,092</u>	<u>8,646,203</u>
<u>WATER DEVELOPMENT</u>			
Supervision	660,419	28,136	688,555
Small Projects including Engineering	10,932,793	888,717	11,801,510
Large Irrigation and Storage Projects			
Supervision	1,493,216	61,262	1,554,478
Construction and Improvements (c & e)	5,229,449	555,677	5,785,126
Maintenance and Operation	3,031,126	1,139,684	4,170,810
Re-establishment of Farmers	181,181	3,518	184,699
Survey and Explorations	1,660,484	---	1,660,484
Purchase of Land	670,656	12,754	683,410
Total	<u>23,859,324</u>	<u>2,669,748</u>	<u>26,529,072</u>
<u>Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service)</u>			
	4,966,394	---	4,966,394

Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service)

SPECIAL VOTES UNDER P.F.R.A. ADMINISTRATION

	<u>1935 - 1952</u>	<u>1952 - 1953</u>	<u>Total</u>
Assiniboine River, Surveys and Construction	68,410	49,991	118,401
Lillooet Project B.C. Construction & Explorations	1,142,867	20,944	1,163,811
Land Reclamation & Development in B.C.	(j) 1,411,434	163,281	1,574,715
St. Mary's Irrigation Project - Alberta	(i) 10,472,461	1,410,538	11,882,999
Bow River Project - Alberta	6,738,745	4,892,773	11,631,518
Red Deer River Project - Alberta	(g) 666,511	40,314	706,825
Other Miscellaneous Projects - Construction	210,392	---	210,392
Land Protection & Reclamation - Manitoba	396,752	179,008	575,760
South Saskatchewan River Project - Saskatchewan	(g) 2,243,462	444,469	2,687,931
Buffalo Pound Project - Saskatchewan	---	35,934	35,934
Surveys and Engineering Costs	(l) 2,172,378	(1) 981,632	3,154,010
GRAND TOTAL	<u>25,523,412</u>	<u>8,218,884</u>	<u>33,742,296</u>

(a) Included in Cultural Administration to March 31, 1938.

(b) Included in Water Development Administration to March 31, 1938.

(c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.

(d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.

(e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.

(f) Includes \$147,530.22 expended on St. Mary Project (administration) in 1947-48.

(g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.

(h) General Survey charges now being paid from other P.F.R.A. Votes.

(i) Amounts shown in notes (d), (e) and (f) to be added to this total.

(j) Veterans' Land Act expenditure not included.

(k) Expenditures until 1949-50 included under Land Utilization and Water Development.

(l) Previously under P.F.R.A. Vote (see item (g)).

(m) Re-establishment of Farmers now under Water Development.

(n) Previously under Land Utilization (see item (m)).



# EXPENDITURES BY PROVINCES

## PRAIRIE FARM REHABILITATION ACT AND SPECIAL VOTES UNDER ITS ADMINISTRATION

April 1, 1935 - March 31, 1953

	<u>Man.</u>	<u>Sask.</u>	<u>Alta.</u>	<u>B.C.</u>
P.F.R.A.				
Major Irrigation and Reclamation in the Prairie Provinces	3,434,126	31,177,224	5,215,595	
Land Reclamation, Construction and Development in B.C.		2,820,858	24,322,925	2,738,069
Land Protection and Reclamation (Man)	599,421			
Dyking and Cut-off (Assiniboine, Manitoba)	118,401			
Surveys and Engineering Costs	185,804	1,521,354	1,312,933	122,531
Administration	190,957	1,563,545	1,349,345	125,930
	<u>4,528,709</u>	<u>37,082,961</u>	<u>32,200,798</u>	<u>2,986,530</u>
				<u>\$76,799,018</u>

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# R E V E N U E

## REVENUE RECEIVED FROM PROJECTS UNDER P.F.R.A. OFFICE

To March 31, 1953.

Pasture Operation and General Revenue	2,528,451
Irrigation Project Operation (under P.F.R.A. Vote)	364,116
Irrigation & General Revenue (Major Projects Vote)	614,133
Total	<u>3,506,700</u>



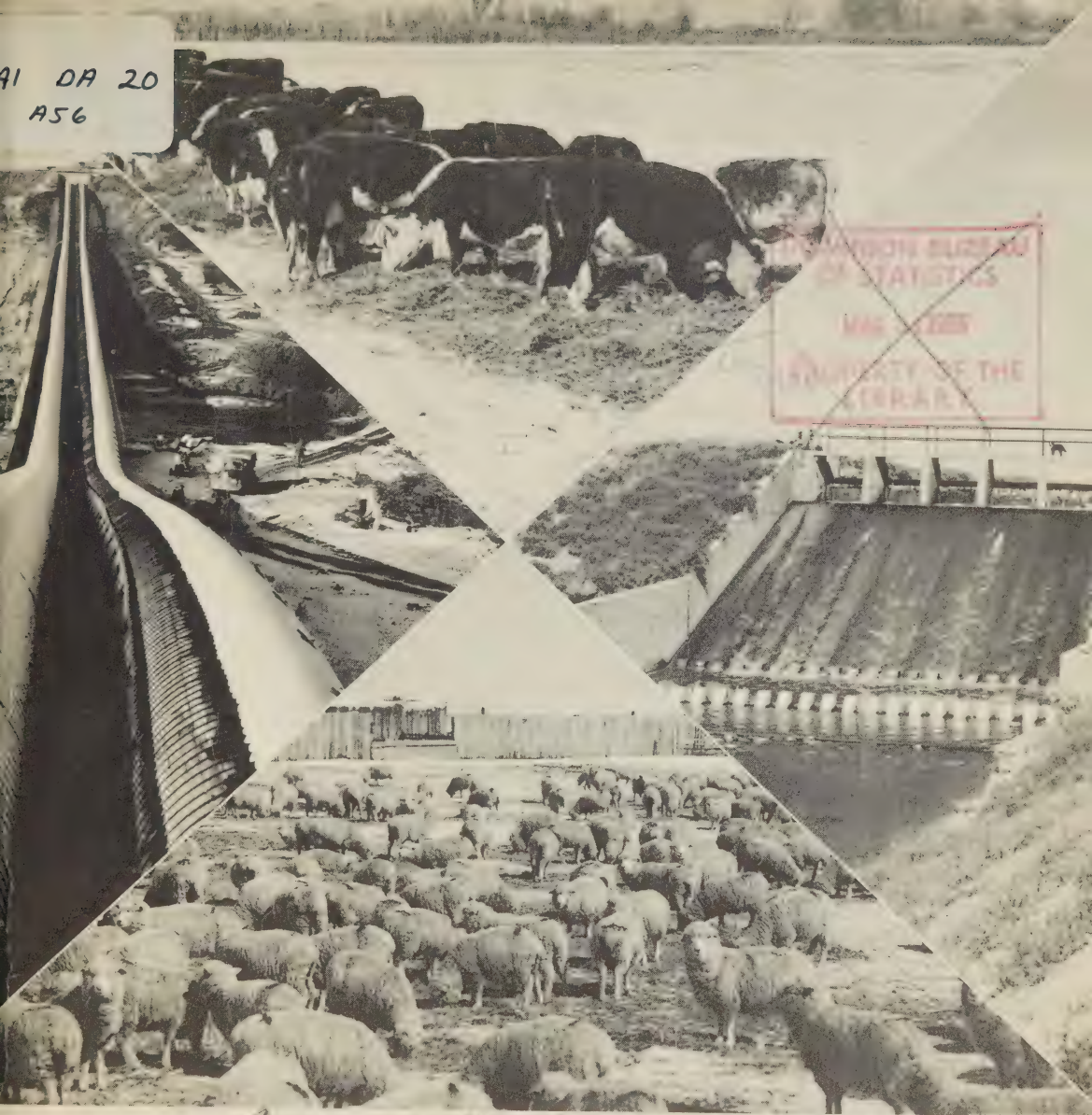








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*Canada, Agriculture, Department of*  
**REPORT**  
*Prairie Farm Rehabilitation Branch*

ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1953 - 54

CANADA DEPARTMENT OF AGRICULTURE  
PRAIRIE FARM REHABILITATION BRANCH  
REGINA, SASKATCHEWAN

## COVER PHOTOGRAPHS

The cover of this report refers to the Bow River Irrigation Project in south-central Alberta.

The top and bottom photographs illustrate the growing emphasis that is being placed on the livestock industry on the project. Irrigated pasture and irrigated forage crops guarantee adequate feed supplies at all times.

At the left are the twin, wood-stave siphons that conduct the waters of the main irrigation canal across the West Arrowwood Creek. Each of these siphons is eight and one half feet in diameter.

At the right is one of the concrete chute structures on the main irrigation supply canal near Hays, Alberta.

For the complete story of the Bow River Project see the section entitled Major Irrigation and Reclamation Projects.

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Prairie Farm Rehabilitation  
and Related Activities  
1953 - 54





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## INTRODUCTION

The Prairie Farm Rehabilitation Act, as originally passed in 1935, provided for the spending of four and three-quarter million dollars over a five-year period in measures to provide for the rehabilitation of drought and soil drifting areas in the Prairie Provinces. An amendment in 1937 extended the scope of the program by making specific provision for the withdrawal of poor quality lands from cultivation and the resettlement of the farmers operating such lands. By a further amendment in 1939 the five-year limitation was removed and the Act was continued in force indefinitely.

Many policies and projects have been carried out under the Act in the nineteen years since it came into force. They vary widely in their nature and in their scope but each one has had as its objective the control of soil drifting, the better utilization of land or the conservation of water for farm purposes. This Report endeavours to describe the various types of undertaking included in the P. F. R. A. program and to give some idea of the results achieved to date.

The organization developed within the Department of Agriculture to administer the Prairie Farm Rehabilitation Act has also been made responsible for the construction of other irrigation, land reclamation and land development works which, because of size or location, are not included in the P. F. R. A. program but are provided for by special votes. These too are covered by the present Report.

While the Report is primarily concerned with the work done in the year 1953-54 it also deals in a general way with the P. F. R. A. and Special Project programs as a whole.

## ORGANIZATION AND ADMINISTRATION

The P. F. R. A. has its headquarters at Regina, Saskatchewan. It is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa.

The organization in Regina consists of the Director's Office, the Water Development Branch, the Engineering Services Branch and the Community Pasture Branch; the branch heads being responsible to the Director.

The Director's Office co-ordinates the activities of the different branches of work with the regional, district and special project offices in the field. It also administers resettlement and rehabilitation activities.

The Water Development Branch covers the extensive program of small and community water storage projects, and the development of small irrigation projects.

The Engineering Services Branch is responsible for Surveys, Soil Mechanics, Drainage, Design, Hydrology, Air Survey and Engineering Geology, and Stream Bank Erosion work. The Soil Mechanics section is located in Saskatoon with a laboratory at the University. The Hydraulics Section of the Design Division utilizes a newly constructed model-testing laboratory in Regina. The foregoing services are co-ordinated to establish the feasibility of the many types of projects that the staff is required to investigate. The construction of major irrigation and reclamation projects is administered through project headquarters and their activities planned and undertaken through the different divisions of work.

The Community Pasture Branch is an important part of land utilization. It undertakes construction of new pastures and associated facilities as well as the supervision for the operation of the pastures.

In addition to the Head Office in Regina there are Regional Offices in Winnipeg, Man. , and Kamloops, B. C. , plus 18 District Offices and nine Project Offices throughout the four western provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and complexity of the particular project.

Since the P. F. R. A. activities are closely allied to those of certain Provincial Government Departments every endeavour is made to co-operate with these agencies. Similarly, the Branch maintains a close liaison with other branches and departments of the Government of Canada upon which it relies for much of its basic information.

Fundamentally, the P. F. R. A. is organized to carry out a program of work aimed at a greater security and stability for prairie agriculture.

## COMMUNITY PASTURES

In 1937 the Prairie Farm Rehabilitation Act was amended and its scope broadened to include the establishment of community pastures. This program was designed to rehabilitate people from submarginal cropping land and at the same time to convert those areas from a liability to a productive national asset.

The Governments of Saskatchewan and Manitoba selected a number of areas which they considered in need of such a program. After clearing all encumbrances on the land the Provinces approached the Government of Canada which, in turn, agreed to finance and construct community pastures in the areas indicated.



A Community Pasture patron returns his stock to the home pasture after fall round-up. Dundurn Community Pasture, Dundurn, Saskatchewan.

# SASKATCHEWAN

## COMMUNITY-PASTURES UNDER THE

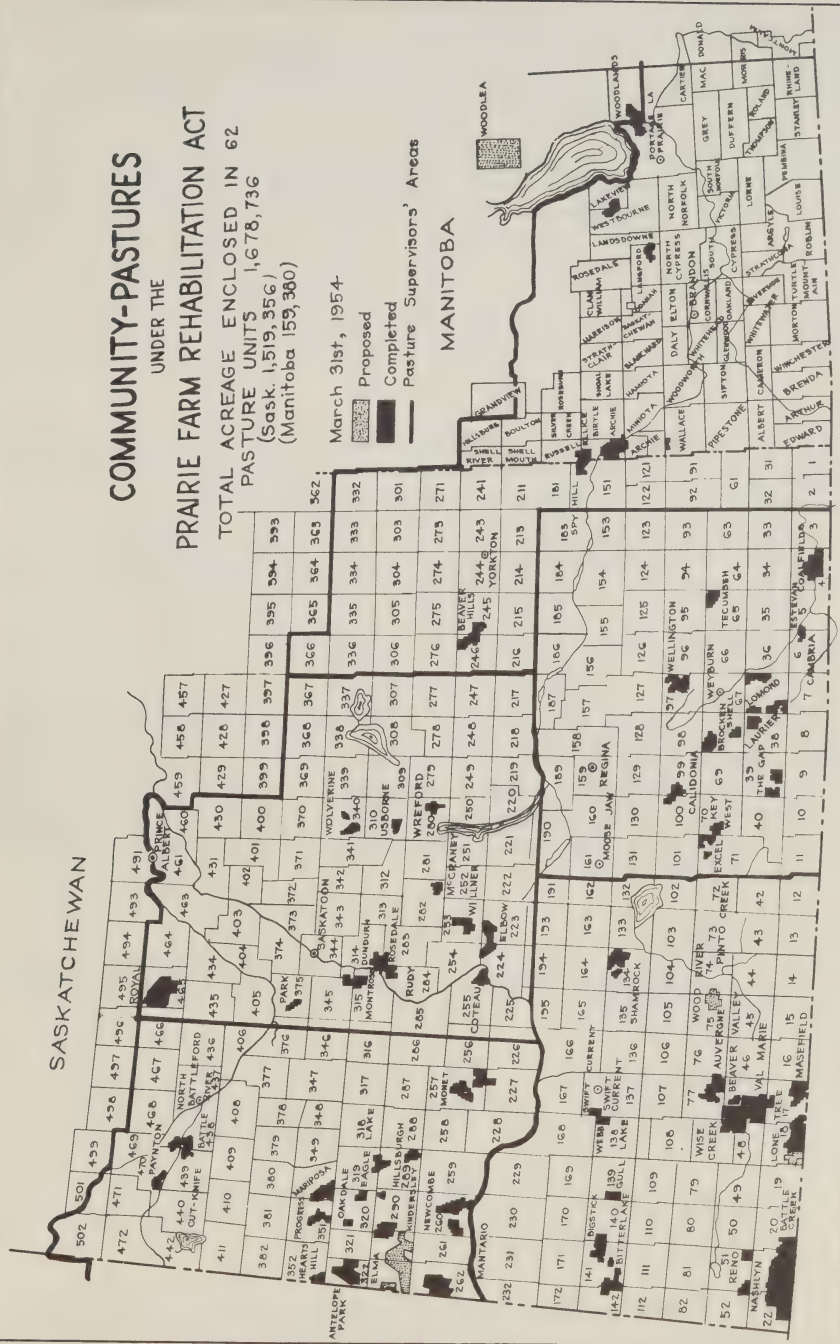
### PRAIRIE FARM REHABILITATION ACT

TOTAL ACREAGE ENCLOSED IN 62  
PASTURE UNITS 1,678,736  
(Sask. 1,519,356,  
(Manitoba 159,380)

March 31st, 1954

Proposed  
Completed  
Pasture Supervisors' Areas

MANITOBA





The community pasture program has concentrated on retiring these submarginal cropping lands to grass and managing the areas as grazing units for livestock owned by local people. The Rehabilitation and Resettlement section, along with the Water Development Branch, has been able to resettle many of the people from the submarginal cropping lands onto new, irrigated properties. Here with financial and technical assistance these farmers are given an opportunity of applying their labor to land capable of returning them a profit. Through careful management plus the introduction of new and productive grasses land that was once a liability has come to prosper as part of the community pasture unit.

At the present time there are 62 P. F. R. A. community pasture units in operation representing a total of 1,678,736 acres. During 1953-54 over 110,000 head of stock belonging to 6,421 patrons were handled by these community pastures.

Since the inception of the community pasture program 4,082 miles of fencing have been erected, 450 major headquarter and operational buildings have been completed as well as 100 corrals and bull sheds.

Complete details of acreage, construction costs and numbers of livestock pastured will be found in appendices I and II of this report.

#### PASTURE OPERATIONS

Dry conditions at the start of the 1953-54 season caused no serious setbacks thanks to the reserve of grass carried over from 1952. The season materialized into an exceptionally favorable one both for rainfall and grass growth. Practically all pastures had an abundance of grass for summer grazing and a good carry-over in addition. Crested wheat grass made excellent growth, even under heavy grazing, and fields kept for haying purposes gave good yields of high quality fodder.

#### PASTURE SERVICES

Pasturage is allocated by the Pasture Advisory Committee on the basis of need in the following manner:

1. First pasture privileges will be given to any farmer who has been moved out of the pasture by the Administration and relocated within the municipality where the pasture is situated.
2. Second pasture privileges will be given to all other bona fide farmers located within the municipality or municipalities in which the pasture is situated.
3. If the pasture can carry additional livestock, the pasture privileges may be extended into adjoining municipalities on the basis of need up to the carrying capacity of the pasture.

4. In order that the pasture privileges may be extended to as many residents as possible, the Advisory Committee shall set a maximum number of livestock to be accepted from any one person. This maximum may be varied according to local conditions.
5. All applications for pasture privileges must be received not later than March 15 of each year and shall be passed upon at the first meeting of the Advisory Committee subsequent thereto.

The following is a schedule of P. F. R. A. pasturage fees and service charges in effect at the present time:

#### Grazing Rates

Cattle per month	0.75
Horses per month	1.00
Sheep per month	0.07 (provide own herder)
Cows (breeding service)	3.00
Colts born in pasture, flat rate	3.00 up to and including November 30 of current year.
Calves born in pasture, flat rate	2.00 up to and including November 30 of current year.

A Minimum grazing charge equivalent to three months' fees will be levied against any animal recorded for pasturage.

#### Rates for Vaccine and Sundry Services

Blackleg, Hemorrhagic and Mixed Vaccine	0.15 per single dose
Dehorning	0.50 per head
Warble and Horn Fly spraying (treatment at corral)	0.15 per head
Mineral Supplement	0.35 per head
Castration:	

Cattle under six months	1.00 per head
Cattle six months and over	2.00 per head

Encephalomyelitis and Special Vaccines	At cost
---	---------

Where extra hay or wood in community pastures is available, the following rates will apply, subject to approval of pasture manager and confirmation from head office.

All hay must be put up on share basis, such to be governed by quality and quantity available.

Dry Wood	0.50 per cord
Green Wood	1.00 per cord



Adequate watering facilities are essential on Community Pastures. An aerial view of a stockwatering dam on the Cap Community Pasture at Hardy, Saskatchewan.

## HAYING

Haying conditions were generally good in most pastures during 1953. A total of 4,064 tons of crested wheat grass, mixed grasses and wild hay were cut and stacked.

## REGRASSING

During the 1953 season 6,800 acres of community pasture land were seeded to grass. Crested wheat grass was established on 2,200 acres, brome and crested wheat grass on 3,445 acres and the balance amounting to 1,155 acres was made up of mixed grasses. An estimated total of 180,293 acres have now been reseeded within community pastures. This figure does not include those areas regrassed by P.F.R.A. and subsequently incorporated into community pastures prior to 1939.

This regrassing policy, coupled with a program of water development and controlled grazing, has resulted in the tripling of the original overall carrying capacity of the pastures.



The regrassing program on P.F.R.A. Community Pastures has been responsible for substantial increases in carrying capacities. These cattle are grazing on an area of crested wheat grass on the Wolverine Community Pasture at Guernsey, Saskatchewan.



## BREEDING SERVICE

Bulls used in the breeding service in operation in P.F.R.A. community pastures are provided by the Government of Canada, on a rental basis, to the Grazing Associations. The amount of the annual rental is based on the average cost, the average length of service and the average amount realized at time of disposal. A total of 1,422 purebred, beef-breed bulls have been used in this service to date and 802 were in use in the 1953 season. The latter total is made up of 705 Herefords, 93 Shorthorns and 4 Aberdeen Angus.

A total of 20,778 cows were handled by this service and a calf crop of approximately 88 per cent is expected.

## PASTURE CONSTRUCTION

A construction and maintenance program was carried out on all pastures during the 1953-54 season. A total of two hundred and one miles of fencing was constructed and the fenced pasture acreage was increased by 26,716 acres to bring the current enclosed area up to 1,678,736 acres. The new Rural Municipality of Willner # 253 pasture of 12,800 acres, is included in this total.

Two new houses for pasture headquarters were constructed, nine were remodelled and eight were modernized with plumbing installations. One new barn was erected and five others remodelled. Seven new garage workshops were built along with 13 combination barn shelters, granaries, and riders' cabins. A total of 14 corrals were completed utilizing some material salvaged from nine old corrals. Eleven Texas gates were installed and a further 11 were repaired.

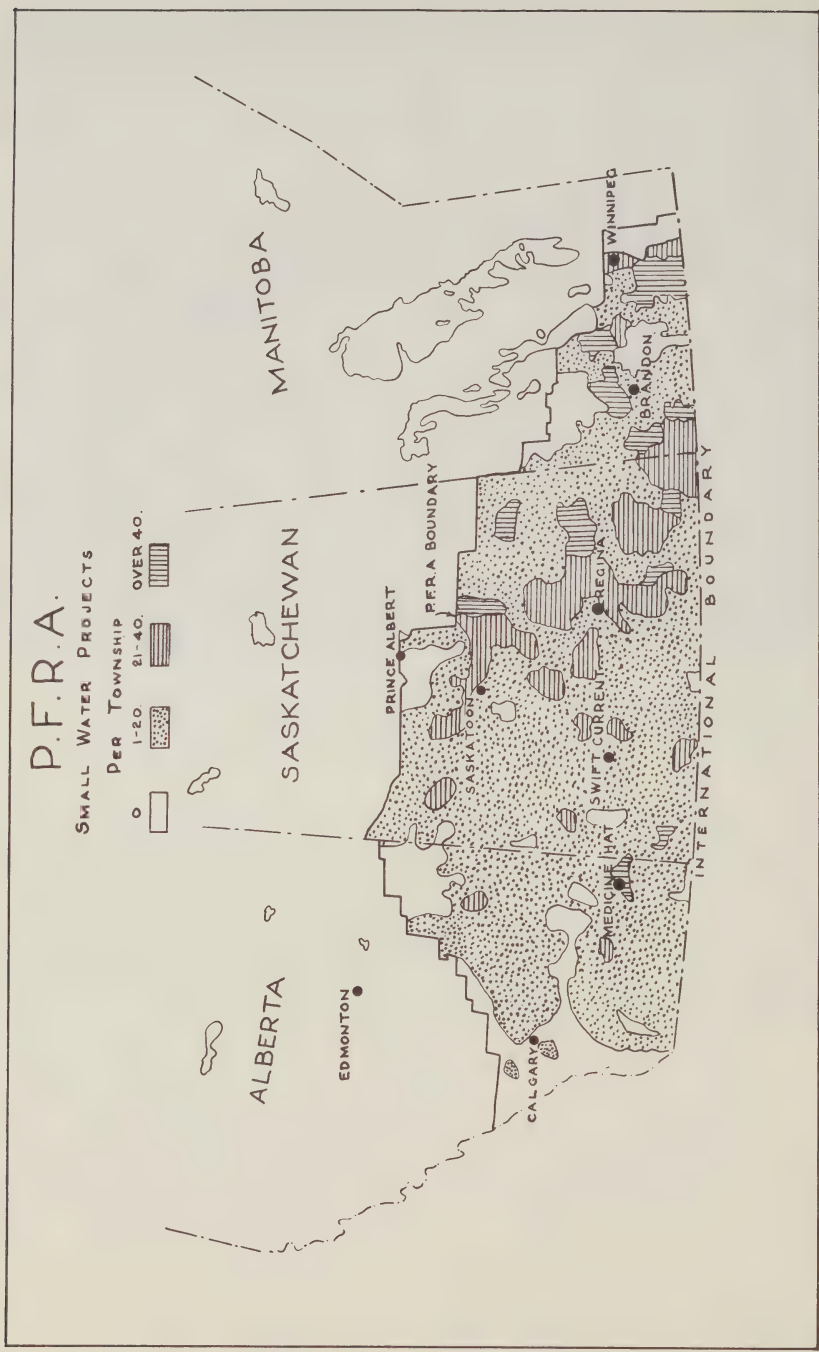
The main water development work consisted of 19 new wells, 13 dugouts and four dams.



Pasture Headquarters on the Spy Hill Community Pasture near Welby, Saskatchewan.

## LIVESTOCK LOSSES AND INSURANCE

During 1953, 32 pastures elected, on their own initiative, to carry livestock insurance. Twenty-four of these carried Mutual Insurance and eight carried insurance with a Line Company. A total of 57,061 head of stock were covered. Losses amounting to 407 were reported and of this number 321 were eligible for insurance. The premiums collected amounted to \$34,915.93 while the indemnities paid totalled \$16,015.56 The overall losses from all causes whatsoever approximated two thirds of one per cent.



## WATER DEVELOPMENT

The Water Development Branch of P. F. R. A. is concerned with assisting individual farmers and communities within the P. F. R. A. area to establish water storage works. Water thus provided may be used for a variety of purposes such as irrigation, stockwatering, domestic use, town supply or recreation.

Work carried out by the Branch is divided into three categories comprising individual and neighbour farm projects, community projects and irrigation and storage projects.

Technical and/ or financial assistance is provided in the case of individual and neighbour farm projects but the responsibility for actual construction remains with the farmer. Community projects on the other hand may be both built and financed by the Branch depending on the circumstances. Classified as irrigation and water storage are those projects which are too big to be handled, even in part, by local bodies and are yet too small to come under the classification of major irrigation and reclamation works. The capital works for such projects are usually financed by P. F. R. A. and the distributory works by the Provincial Governments or other local bodies.

### INDIVIDUAL AND NEIGHBOUR FARM PROJECTS

These projects are primarily intended to catch and store runoff water from melting snow. The type of construction is either a dugout, dam or diking system. A dugout is simply a strategically located excavation of sufficient capacity to meet the requirements of a farm unit or units. It commonly contains in the vicinity of one and one half acre feet of water.

Individual schemes refer to those benefiting one farm only while a neighbour project represents two or more neighbours building a somewhat larger project for their common use.

During the 1953-54 fiscal year a total of 2,106 individual projects were completed. This figure represents 1,755 dugouts, 174 stockwatering dams and 177 small irrigation schemes. Over the same period 27 neighbour projects representing 19 dugouts, four stockwatering dams and four irrigation projects were completed.

Under its program of financial assistance P. F. R. A. reimbursed farmers in the total amount of \$269,073.75. The rates of assistance paid were the same as those in effect over the last few years namely four and a half cents per cubic yard for earth moved; twenty five cents per cubic yard for rock or field stone placed to protect earthwork plus the actual cost of construction materials such as pipe, cement and lumber. In the case of individual projects the maximum financial assistance rendered was \$125 for a dugout, \$150 for a stockwatering dam and \$350 for an irrigation system. Neighbour projects on the other hand,



while retaining the same rates, had the maximum increased to \$500 irrespective of the type of project.

Individual and neighbour projects constructed in 1953 amounted to 2,133 bringing the total established since the inception of the program to 50,005.

A survey shows that farmers constructing these projects own 70,066 cattle, 17,136 hogs, 10,937 sheep and 6,216 horses.



By impounding runoff water in a natural depression the community of Hanna, Alberta, has an assured water supply.

#### COMMUNITY PROJECTS

In cases where farmers form a Water Users' Association with the intention of storing and utilizing water on a community basis the P. F. R. A. will co-operate with the group. Rural Municipalities having the same objectives as the Water Users Associations are also included under this scheme.

Provided that the proposed project is feasible from all aspects the Government of Canada may assume the cost of the capital works involved. On irrigation projects this does not include the cost of the distribution system for irrigating.

The Province concerned or the Water Users' Association usually undertakes this work.

A total of 29 such community projects were completed during the year. These figures include a number of large dugouts for both urban and rural supply. Under the community water development program the communities concerned supply the right-of-way and undertake to operate and maintain the projects after construction. A total of \$129,355 was spent by P.F.R.A. on Community projects during the fiscal year.

In Alberta 13 community projects were completed in 1953. A group of ranchers near Walsh commenced the development of an irrigation project using the waters of McKay Creek while a community near Pincher Creek constructed works to control and utilize Indian Farm Creek. The town of Castor established a domestic water system supplied from the Castor Reservoir which was constructed prior to 1953. By the close of the fiscal year this was meeting the needs of 183 people. Originally developed for stockwatering and irrigation, the Hanna and Bull Pound reservoirs were also utilized by the town of Hanna for domestic purposes and the development of a community centre.



The newly renovated Morden Dam on Dead Horse Creek, Manitoba. The crest of this dam was raised and the spillway capacity increased to meet the growing demand for water in the Morden district.

In Saskatchewan 14 community projects were completed in 1953. The majority of these projects were dugouts but in the Lancer district a group of farmers co-operated to open a canal to reclaim 1,200 acres of excellent land which may be irrigated by spring runoff.

In Manitoba the only community projects completed were two large dugouts located at Deloraine and Waskada.

#### IRRIGATION AND STORAGE PROJECTS

During 1953 a total of \$640,018 was spent on nine irrigation and storage projects of which five were completed.

In Saskatchewan the work was undertaken on dams on Pheasant Creek near Lemberg; Kaposvar Creek near Melville and the Pipestone Creek south of Moosomin. The Coronach project was completed and further construction was carried out on the Highfield section of the Swift Current project.

In Manitoba the largest undertaking was the Morden dam on Dead Horse Creek. The height of the original dam was raised 13 feet and the spillway increased to carry 12,000 cubic feet per second. These improvements have now resulted in adequate water for local agricultural and industrial requirements. In addition to the Morden dam another stockwatering dam was completed on the LaSalle River while at the town of Neepawa a stockwatering and town supply reservoir was constructed. Minor construction was also carried out on the Souris dam to bring that project to its completion.

#### TECHNICAL ASSISTANCE

In addition to the financial assistance outlined above, the P. F. R. A. program also includes free engineering and agricultural services. Demands for these services were unusually large in 1953 because of extensive water control and water erosion work caused by cyclonic rainfall.

During the season 7,976 visits were made to individual farms as follows:

##### Agricultural Services

###### Dugouts

Preliminary calls	1,056
Final inspections	1,533
Miscellaneous inspections	463

###### Stockwatering Dams

Preliminary calls	403
Final inspections	81
Miscellaneous inspections	176
Small Irrigation Projects	
Preliminary calls	423
Final inspections	84
Miscellaneous inspections	260
Community Projects	
Preliminary calls	92
Final inspections	24
Miscellaneous inspections	96
Engineering Services	
Small Irrigation Projects	
Miscellaneous inspections	1,064
Surveys	334
Plans prepared	189
Final certificates	132
Stockwatering Dams	
Miscellaneous inspections	551
Surveys	308
Plans prepared	181
Final certificates	177
Community Projects	
Projects instigated	180



Projects built	29
Survey and plans	55
Maintenance	69

## REHABILITATION AND RESETTLEMENT

According to the terms of the Prairie Farm Rehabilitation Act considerable emphasis has been placed on a policy of rehabilitation and resettlement of people from those areas of the prairies where drought conditions have rendered arable farming a hazardous and frequently uneconomic pursuit.

Many farmers, in attempting to balance their farming by increasing their livestock, have been faced with difficulties in securing sufficient grazing land and in some years have been forced to reduce their stock numbers because of lack of feed.

The approach to these problems has been one of providing key irrigation projects to answer local needs coupled with a policy of resettlement onto economic units on larger irrigation projects.

Lands vacated under the resettlement policy have been regrassed and incorporated into community pastures where they meet the needs of those farmers remaining in the area for extra grazing and fodder.



Reseeding operations on land, vacated under the P. F. R. A. resettlement policy. This is in the Masfield area of Saskatchewan.

SASKATCHEWAN

VAL MARIE IRRIGATION PROJECT

This project now serves 75 farmers and ranchers as well as others in the district. A large percentage of the irrigated land is devoted to forage production for the winter maintenance of cattle.

Five hundred acres of fringe land has recently been added to the project and this may provide additional hay or grazing depending on the needs of the people.

This project has stabilized the livestock economy of farmers within the area and more emphasis is being placed on the building up of reserve feed supplies as the operators see the need for carrying over hay from one year to the next.

WEST VAL MARIE IRRIGATION PROJECT

This newly developed project is now serving an additional thirty farmers and ranchers in the Val Marie district. It is well suited for the permanent establishment of wintering sites in the Frenchman River Valley. Approximately 2,000 acres of the 3,000 acres under development, are currently seeded to irrigated forage crops.

EASTEND IRRIGATION PROJECT

Considerable renovation work was carried out on the distribution system of this project during 1953. This work was occasioned by the severe flooding which occurred in 1952.

There is a growing interest among the project's 55 settlers to use some of their lands for irrigated pasture. A considerable area of fringe land, hitherto quite unproductive, is being improved and used in this manner. Plot holders are improving their crop production program, placing special emphasis on larger acreages for forage production.

An indication of the importance of the livestock situation on this project may be gathered from the following table:

Number of cattle wintered	1,800
Number of cattle fattened for market	500
Number of sheep wintered	1,500
Number of lambs fattened for market	800

## RICHARDSON - McKINNON - NASHLYN IRRIGATION PROJECTS

Development on these projects, comprising some 3,000 acres, is nearing completion. Operated by 35 settlers, approximately 2,500 acres of irrigable lands are now seeded to permanent forage crops and the extra feed from these areas is being utilized by livestock producers in the Consul district.

Five hundred head of cattle were fattened on the project during the fall and winter months of 1953.

## MAPLE CREEK IRRIGATION PROJECT

This project has reached a stage of stability and now serves 140 farmers and ranchers. Approximately 80 per cent of all the developed irrigable land, totalling 6,000 acres, is now in hay production.

At present special investigations are being made to provide additional water storage facilities so that more land may be developed for irrigation.

Four hundred acres of land were recently added to the project and when this is fully developed a further ten livestock producers in the district will be served.

## SWIFT CURRENT IRRIGATION PROJECT

At the present time there are 226 farmers in the 6,000-acre, Rush Lake area of the Swift Current Irrigation Project. The lateral distribution system in this region is being improved and extended so that individual land owners at Waldeck will be able to make use of water on their privately owned lands. A total of 25 farmers can now be served and they will be operating this section of the project under their own Water Users' Association.

During 1953 construction of the main canal to the Herbert area was completed. The 35 water users in this district are now ready to go ahead with their own individual irrigation development. In addition to the area at Herbert there is a considerable acreage of fringe land between Rush Lake and Herbert which will be served by the main canal.

Engineering investigations and surveys have now been completed for the extension of the Swift Current Project to the Neidpath and Hodgeville areas along Wiwa Creek.

Approximately 2,000 acres of land in the Rush Lake area are seeded to forage crops. Farmers adjacent to the project are utilizing the feed for winter maintenance of livestock and a large number are producing whole milk for the city of Swift Current.





The movement of families from the dried-out, crop-failure areas of Saskatchewan to the Bow River Project, has meant the opportunity for a new start in a district with a promising future. Above is an abandoned farmstead in the Masfield area of Saskatchewan and below is a newly constructed home in the Hays district of the Bow River Project.

### ALBERTA

During 1953 P.F.R.A. was active in resettling farmers, from both Saskatchewan and Alberta, onto irrigated lands in the Central Block of the Bow River Project. Further details of this work will be found under the section dealing with the Bow River Project.

Resettlement and rehabilitation work is continuing in Alberta under the direction of the Alberta Government on the St. Mary Irrigation Project.

Located north and east of the town of Brooks on the Berry Creek is a dam impounding 20,000 acre feet of water. This reservoir assures an adequate flow in the lower reaches of the stream to the point where it joins the Red Deer River. Established along this area are a number of pumping plants serving the ranchers of the district. The project is potentially capable of irrigating 8,000 acres. This scheme will be incorporated into the Red Deer River Project should the latter be constructed.

The Macleod Project which takes its water from the Oldman River was improved during the year by the doubling of the capacity of its pumping plant.

Extensive improvements were made by the District itself, in co-operation with the Alberta Government, enabling the land owners to plan the subdivision of their dry-land farms for the settlement of their sons and for some sales. This project is capable of irrigating over 10,000 acres, sufficient to establish at least 100 new families.

All the above projects are doing much to overcome problems of drought and hardship and in addition are promoting a healthier agricultural economy based on diversified types of production. More emphasis is currently being placed on livestock, including sheep, and the growing of high-grade, irrigated forage. This coupled with specialized crops such as sugar beet and canning vegetables is doing a great deal to stabilize western agriculture.

## CONSTRUCTION, EQUIPMENT AND SUPPLY DIVISION

This Division provides a combination of services which are available to all branches of P.F.R.A. but particularly to the Water Development and Community Pasture Branches in the construction and maintenance of projects of various types.

While much of this work can be done with conventional equipment available from local contractors, it is sometimes necessary to modify standard machines or design and develop equipment for specific jobs. Shop facilities available at Moose Jaw and Vauxhall are equipped to do this machine development work which may involve automotive, electrical, or construction equipment. Also, when a type of equipment not ordinarily used locally appears to have some advantage for special work, it is arranged to give the machine a trial under actual working conditions. This program of modification and investigation has enabled several machines to be introduced for special projects without involving local contractors in the risks associated with experimentation. Such machinery is frequently of little use to the contractor outside of the specific project for which it was originally obtained.

Many jobs of maintenance and operation on irrigation and community pasture projects require adequate and suitable equipment for short periods of time, often on short notice. Local equipment is sometimes available, but frequently it is necessary to have P.F.R.A. equipment on hand to deal with emergency problems or to supplement local equipment that may be hired. A variety of basic machines are available for this purpose. These are maintained and operated by experienced personnel who can serve as job foremen when required.

Many P.F.R.A. survey and maintenance crews use mobile trailers for all camp accomodation and these units are constructed in the Moose Jaw plant during winter months when field personnel can be employed. During the year, 31 new trailers were built and various repairs and modifications were carried out on 12 others.

Whenever practical, supplies are purchased directly for specified jobs. However, it is also necessary to keep on hand a stock of many materials required for maintenance, small construction jobs and emergencies. The volume of stores handled during the year amounted to approximately \$250, 000.

A complete annual inventory is maintained covering all P.F.R.A. equipment. All camps, buildings and vehicles are regularly inspected by fire prevention, safety and sanitation officers.

## ENGINEERING SERVICES

For many of its projects P.F.R.A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is seldom available from outside sources, the organization has set up a number of divisions under the general heading of Engineering Services.

### HYDROLOGY DIVISION

The Hydrology Division was established in April 1952 with the main purpose of conducting hydrological studies and preparing reports. The studies undertaken may be classified under three general headings; flood potential determinations; water supply and utilization studies for individual projects and water supply and utilization studies on watershed bases. In addition to this work the Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies.

During the year the flooding potential at several proposed damsites was studied and reported upon. Hydrologic studies for numerous water development projects were undertaken, including several connected with the problems of Buffalo Pound Lake. Studies started during the year but not yet completed deal with Bow River watershed problems, the Upper Souris River flooding problems and the Qu' Appelle River Valley.

Also completed during the year were several overall water supply and water utilization reports as follows:

- |                      |  |
|----------------------|--|
| Hydrology Report #3. | "Water Supply and Irrigation in the Battle Creek Basin", June, 1953.           |
| Hydrology Report #4. | "Water Supply and Irrigation in the Manyberries Creek Basin", September, 1953. |
| Hydrology Report #5. | "Water Supply and Water Use in the Lodge Creek Basin", October, 1953.          |
| Hydrology Report #6. | "Water Supply and Irrigation in the Many Island Lake Basin", January, 1954.    |

Studies in this series that were started but not completed during the year deal with the Maple Creek, Swift Current Creek and Frenchman River Watersheds.

Acting for the Prairie Provinces Water Board the Division followed up the several special requests resulting from the three meetings of the Board held during the year: May 15, 1953 and October 9, 1953 in Regina, and March 18, 1954 in Edmonton.



In addition to the above projects the Hydrology Division works closely with the Swift Current Experimental Station on the Davin Hydrology Research Station. This station was set up and is currently operated by the Experimental Station but the finances are supplied by P.F.R.A. These investigations are directed to establishing relationships between rainfall and runoff in the general area around Davin, Saskatchewan.

### SURVEYS DIVISION

Survey work plays an essential and major part in the P.F.R.A. planning program by providing field data relating to the location, design and construction of projects. P.F.R.A. surveys may be divided into three groups: surveys for irrigation and reclamation planning, and legal surveys.

1. Structure surveys. The first stage in surveying for construction is the reconnaissance survey. Depending upon the size and complexity of a project this may vary from an on-the-spot appraisal by an experienced officer to the use of a number of survey parties for the preparation of maps. The objective is to obtain sufficient information to assess the feasibility of a project with a limited expenditure of time and money.

Assuming a project is feasible in the light of a reconnaissance survey a preliminary survey is then completed. This supplies details of topography and basic data in the vicinity of the proposed structure which is then utilized by the Soil Mechanics and Materials Division and the Design Division.

Once the project moves into construction, final surveys are made for the purpose of supplying lines and grades needed by the contractor. In addition they supply figures for the purposes of payment on material excavated or placed by the contractor.

2. Surveys for irrigation planning and reclamation follow in broad outline the same scheme of reconnaissance, preliminary and final surveys as discussed in the previous section. Aerial photography is being used increasingly in obtaining necessary preliminary topography where large areas are involved.

3. Legal surveys. These surveys are usually made for the purpose of acquiring transfer or title to the land and, hence, are made only for projects in the development stage. Four field parties operated during the year on the Bow River and St. Mary Irrigation Projects. In addition to the work completed by the P.F.R.A. two other surveys were let by contract. Both of these were in connection with the St. Mary Project. In Saskatchewan work was done on the main canal from Highfield Dam to Herbert and a preliminary survey was completed on Buffalo Pound Lake. Other surveys on water development projects included Kaposvar and Pheasant Creek Reservoirs in the Melville district and Junction Reservoir at Maple Creek as well as several small canals in the Swift Current area.

## WILLIAM PEARCE IRRIGATION PROJECT (RED DEER RIVER PROJECT)

During 1953-54 the soil survey work on the irrigable area of this project was continued and the reports were compiled.

One survey party carried out surveys of routes for the diversion of the North Saskatchewan River to the Red Deer River. An alternative to the route proposed by the former Reclamation Branch was investigated. This would leave the Saskatchewan River approximately in Section 28, Township 39, Range 10, West of the 5th Meridian, and would follow the valley of the Prairie River. It will require at least one more season to complete this survey but the reports on hand indicate a very feasible route with possible valuable storage.

## SOIL MECHANICS AND MATERIALS DIVISION

The Soil Mechanics and Materials Division carries out studies and provides technical advice in connection with foundations, soils, concrete and other materials associated with water development structures. In the investigation stage this involves field exploration, sampling, testing, design studies and reports. In the construction stage further detailed exploration and testing is required along with construction control and the installation of special test apparatus. With the structure in service the test apparatuses are utilized to indicate condition and efficiency and to ensure that seepage or deformation does not exceed tolerable limits.

The earlier Annual Reports contain the details of organization, equipment and scope of projects and these will not be repeated. However, several research programs which are being carried out in an attempt to study problems that are peculiar to water development in Western Canada, will be mentioned.

Serious water losses from canals and dugouts have prompted important exploratory investigations on suitable materials for seepage control. The present program has utilized the findings of other organizations but has been primarily concerned with determining the suitability, durability and effectiveness of available materials under local climatic conditions. In general, fairly satisfactory and economical materials are available for canal lining. However, it would appear that the lining of dugouts and small reservoirs is uneconomical except in unusual circumstances. The following lining materials have been considered; compacted earth linings with and without cover, loose earth linings, bentonite linings, asphalt membrane with cover, shotcrete, soil-cement, reinforced concrete and concrete blocks. The compacted earth linings and the asphalt membrane with cover appear to offer the most economical solutions.



The Soil Mechanics and Materials Division maintained this laboratory on the Travers Dam throughout the construction period. Constant checks were made on such factors as moisture content and compaction of fill material.

Extensive research is also being carried out on highly plastic clays and soft clay shales which are encountered at numerous damsites throughout the Western Provinces. These have caused some trouble at water development structures. Unfortunately the existing methods of analysis and study do not appear to be particularly applicable to these materials and at the present time designs are based mainly on personal judgement and precedent. An effort is being made to establish more rational and economical design criteria.

Concrete in hydraulic structures such as dams and irrigation works must be of excellent quality to endure under the severe climatic conditions, the chemical attack of soils, and water with high sulphate content. In order to produce a high quality concrete at minimum cost the processing and preparation of western aggregates is being studied. In addition research projects involving available cements are being carried out.

#### AIR SURVEYS AND ENGINEERING GEOLOGY DIVISION

During 1953-54 this Division has covered a wide field of projects relating to all phases of P.F.R.A. development work.





The above aerial photograph illustrates the site of the Pipestone Dam and Reservoir, currently under construction. The analysis of natural and cultural landscape features in three dimensions in aerial photographs resulted in the detection of this, hitherto unknown, gravel deposit (above), one and one half miles from the site of the proposed dam. Of the 25 potential granular sources mapped, the above deposit proved to have the best material as well as being the closest to the project.



Probably the most important work has been that dealing with the location of granular materials for use in building dams. On 13 projects successful searches were conducted for granular materials utilizing aerial photos. In a similar manner rip-rap was located for a further three projects. This work has eliminated time-consuming and costly field surveys.

A total of over 90 aerial mosaics were prepared during the year covering areas ranging from 25 to 300 square miles. These mosaics have been utilized on the following diverse projects:

- (1) Flood damage surveys in the Riding and Duck Mountain areas of Manitoba as well as land damage on P.F.R.A. projects in Alberta.
- (2) A forest ecology study relating to flood and erosion control in the Riding Mountain Park region.
- (3) Watershed characteristics such as soil, topography and land use in relation to the regulation of runoff.
- (4) Selection of damsites and reconnaissance photo-appreciation of damsites in British Columbia.
- (5) Determination of extent of flooded lands consequent on the establishment of dams. This has been carried out for the proposed South Saskatchewan River Project, the Pipestone Creek and Bow River Projects.
- (6) The geology of the proposed Waterton damsite area.
- (7) The establishment of perimeters of drainage areas.

The Division has at the present time some 266,400 aerial photos in its own air photo library. These photographs cover the greater part of the developed agricultural area of the three prairie provinces.

In addition to the work carried out for P.F.R.A. projects, the personnel and resources of this Division were utilized by the Government of Canada during 1953 for work in Newfoundland and Pakistan.

Initial planning was carried out in connection with a land capability survey study covering all areas of Newfoundland having any economic significance from an agricultural land-use standpoint. This work, which will be further developed in 1954, relies heavily on the interpretation of natural features shown on aerial photographs. Such a study will indicate drainage problems, depth of soil mantle, erosion potential, stoniness and general topography as well as many other less obvious features which may have a profound influence on agricultural land-use. This important work, which may have far reaching effects on the development of the

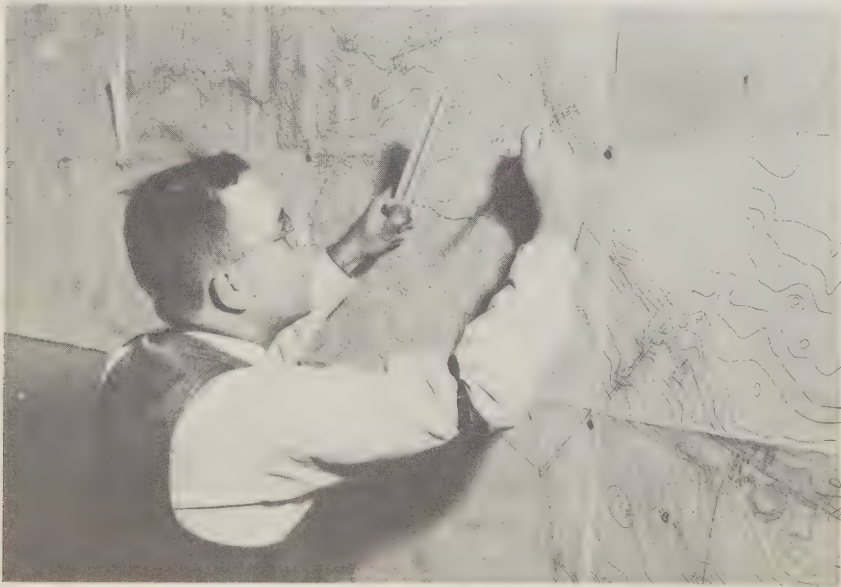
Province, is being undertaken at the request of the Royal Commission on Agriculture for Newfoundland.

As part of the Canadian Colombo Aid Plan the Division is currently advising the Photographic Survey Corporation Limited of Toronto on setting up the methodology and techniques required for identifying and mapping soils and land-use capabilities from aerial photographs of Western Pakistan. This work is designed to assist in planning, developing and improving West Pakistan's agricultural economy.

### DESIGN DIVISION

This Division is concerned with all major engineering designs. Field information and reports from the Divisions of Soil Mechanics and Materials, Hydrology, and Air Surveys and Engineering Geology are assembled here for study by the design staff. From these data two, three or more complete alternative designs are usually prepared and these are carefully compared from economic and engineering viewpoints. During 1953 some 300 detailed drawings were completed under this program.

Once a final selection has been made specifications are written and tenders advertised for each project. The Division was responsible for most of the designing, plan preparations, specifications and advertising connected with 25 projects in the 1953 fiscal year. These contracts represent a total expenditure of \$2,284,000.



An engineer in the Regina Design Office plots the course of a distribution canal on the Central Block of the Bow River Project.

During the year a first draft of the complete specifications covering the proposed South Saskatchewan Dam and its appurtenant works was completed. A photo-elastic analysis of the river diversion conduits through the base of the dam is currently being carried out at the University of Saskatchewan under the Design Division.

In addition to design work for specific projects, design and research of a general nature was carried out on problems affecting many P.F.R.A. structures such as entrances and exits for hydraulic structures, chute slopes, stilling basin layouts and expansion and contraction joints.

A compact, well-equipped hydraulics laboratory was recently constructed in Regina and is now being operated by the Division. Here, scale model testing on various types of hydraulic structures is carried out. The results of these tests often lead to important modifications in designs with improved hydraulic operating conditions and reduced maintenance problems in the prototype. The experimental work being done in the laboratory will be of growing importance to the work of the design engineer.



In the newly constructed hydraulics laboratory in Regina an engineer checks the velocity of water discharged from a scale model of an outlet structure.

The Division is equipped with an up-to-date library comprising some 800 volumes and ten periodical engineering and construction publications.

During 1953 the staff included the Chief of the Division, 15 engineers and ten draftsmen.

### DRAINAGE DIVISION

This Division of the Engineering Services Branch undertakes that work which provides for the free movement of water, both overland and subsurface, so that problems of salinity will not occur in the future. Adequate drainage systems are an essential part of irrigation development, since, for the growing of crops, it is equally as important to get water off the land as it is to put it on. The Division also provides information for the design engineers in the laying out of irrigation systems. During the development of a project the Division works closely with the engineers and soil survey specialists on such problems as seepage in canals and the correct type of drains for specific soil types.

During 1953 investigation work relating to salinity and drainage was carried out on the Bow River Project, the St. Mary Irrigation Project and the Pasquia Area as well as on a number of P.F.R.A. owned projects in southwestern Saskatchewan. Construction work involving exploratory tile laying operations, and land levelling in relation to drainage and reclamation, was carried out as the initial phases of a complete drainage system for the Bow River Project.

Soils work on the Bow River Project included sampling and resampling in the Vauxhall and Hays districts to determine amounts and changes in the soluble salt content in the surface soils. Such studies have indicated where irrigation may best be practised and also provided information on salinity changes for areas currently under irrigation. Further studies were conducted on the Bow River Project in relation to canal seepage losses. This work involved 371 soil samples taken from an area adjacent to Lateral A for purposes of hydraulic conductivity determinations.

On the St. Mary Irrigation Project canal seepage problems were investigated in the Taber region. These investigations indicated the need for a fairly impervious lining material or the installation of a drainage system to cope with the seepage. Other studies, on the same project, were carried out in the Medicine Hat area to determine the saline condition on three local depressional areas prior to irrigation. These studies showed only moderate amounts of toxic salts at depths where they would not affect crops.

In the Pasquia Area a complete study was made to determine the feasibility of the project from a drainage point of view. This work indicated the measures necessary in the engineering plans to provide for adequate drainage in the future.

The soils investigations on the P.F.R.A. projects in southwestern Saskatchewan consisted of resampling the soil sampling stations established in 1952. A total of 25 stations on the Val Marie, West Val Marie, Eastend, Consul,



Maple Creek and Rush Lake Projects were resampled. Analysis of the samples showed that, in general, there had been an upward movement of salts in the soils in these areas. Further drainage work is continuing as a result of these investigations.

The major construction work for 1953 consisted of the laying of 25,865 feet of tile for subsurface drainage on the Bow River Project. This tile was laid both by hand and by machine. To date, 45,880 feet of tile drainage has been provided on the project at an overall cost of \$1.57 per foot. Drainage surveys have been completed and the installation of a further 82,400 feet is contemplated for 1954. Drainage of surface water in the southern part of the project has been practically completed and this work should eliminate salinity problems in the future.

Land levelling and reclamation investigations started in 1952 on a 125-acre block of the Bow River Project were continued on a modified scale, while a further 90 acres have been levelled to a detailed plan, provided with a border irrigation system, and seeded to various grass mixtures as part of the program to bring the area back into production.

### STREAM BANK PROTECTION

Further exploratory work on stream and river bank protection was carried out in Manitoba during 1953. New construction was confined to the completion of three banks on the Assiniboine River west of Brandon. This work involved the installation of 1,688 square yards of brush matting. Other construction involved the maintenance and modification of existing works in the Dauphin area.

The stream bank protection work on Edwards Creek has now reached a stage where the initial construction is completed and the consolidating work of planted vegetation should take over. To this end a further 8,550 willows were planted chiefly on the silt deposits behind cable pile revetments. Efforts are being made to establish a thick line of trees immediately behind and parallel to the piles so that as the pile line deteriorates a live line of trees will be able to take over. Good growth was made by these trees in 1953.

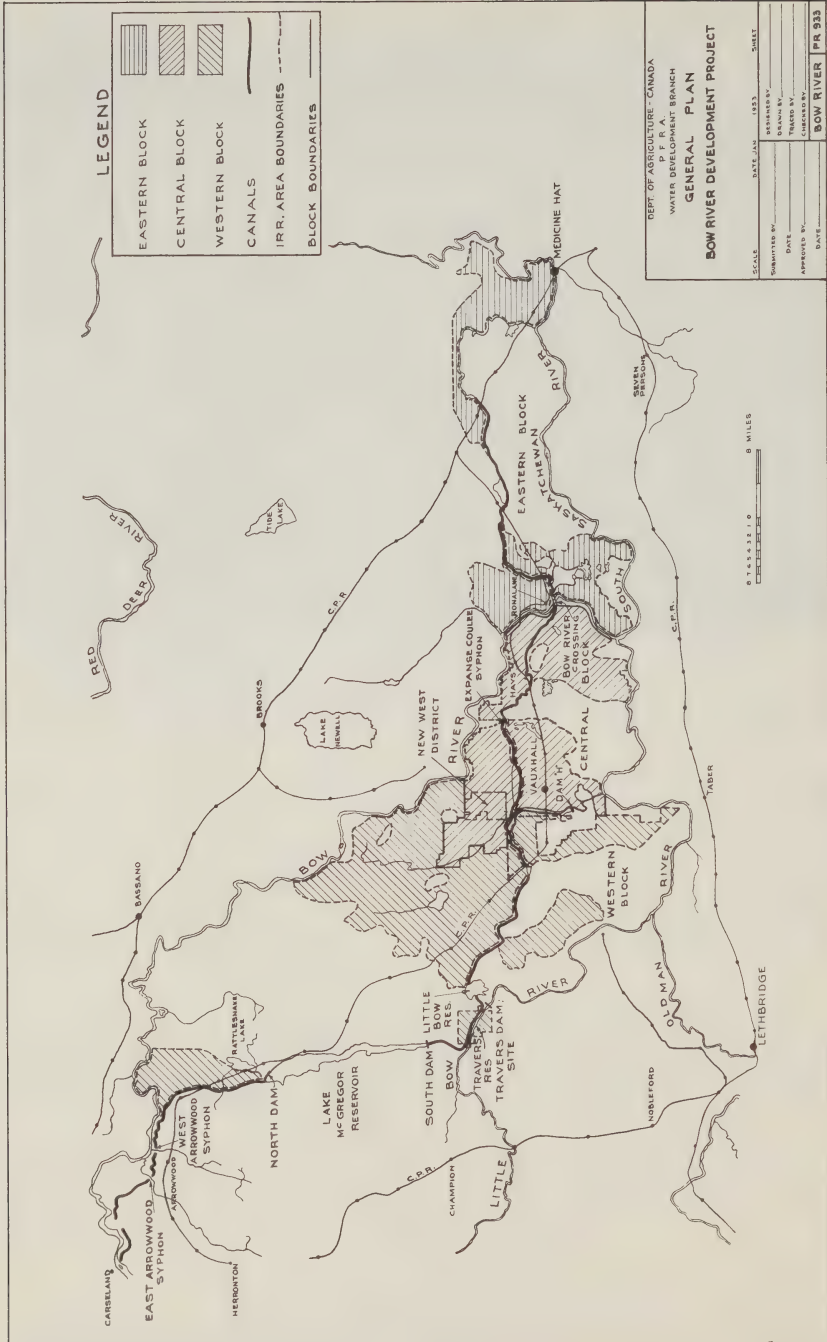
The main modification to existing structures was the establishment of tie-back lines on some of the cable pile revetments. These lines running from the main cable to the bank serve as baffles and further act to slow the stream behind the main protection. The spring of 1954 indicates that these are working effectively.

With minor exceptions the original, grassed, bank-sloping work done in 1949 is holding up well. A good growth of willow is established on much of this and is currently supplying a proportion of cutting stock.

Work on the Assiniboine River in the Brandon area is at a similar stage to that on Edwards Creek. It is expected that the 1954 season will see major growth and consolidation of the willow brush-mat work.



A two-year growth of golden willows planted for protection purposes on a sloped bank of Edwards Creek near Dauphin, Manitoba.



## MAJOR IRRIGATION AND RECLAMATION PROJECTS

The administration of Major Irrigation and Reclamation Projects, involving large expenditures of money, is undertaken by P.F.R.A. for the Government of Canada. These projects may be financed entirely by Canada through a special vote of Parliament or, on the other hand, they may be handled jointly by special agreement between Canada and the Province concerned. Major Irrigation and Reclamation Projects are sometimes referred to as Special Projects.

### THE BOW RIVER PROJECT

Over the last three years a major irrigation project has been in the process of development in southern Alberta. Upon completion it will, along with the St. Mary Project, bring a new phase of agricultural stability to Western Canada. The story behind the emergence of the Bow River Project is one of great expectation, extensive construction plans and frequent bitter disappointment.

The story has its beginning in 1909 when several independent Companies commenced irrigation construction work on part of the area currently occupied by the Bow River Project. These companies, utilizing English capital, spent close to \$13,600,000 on development work. Eight years later the Canada Land and Irrigation Company was formed through the amalgamation of three predecessor companies. The property thus acquired consisted of 532,894 acres valued at \$2,416,561. Approximately 200,000 acres of this were considered irrigable.

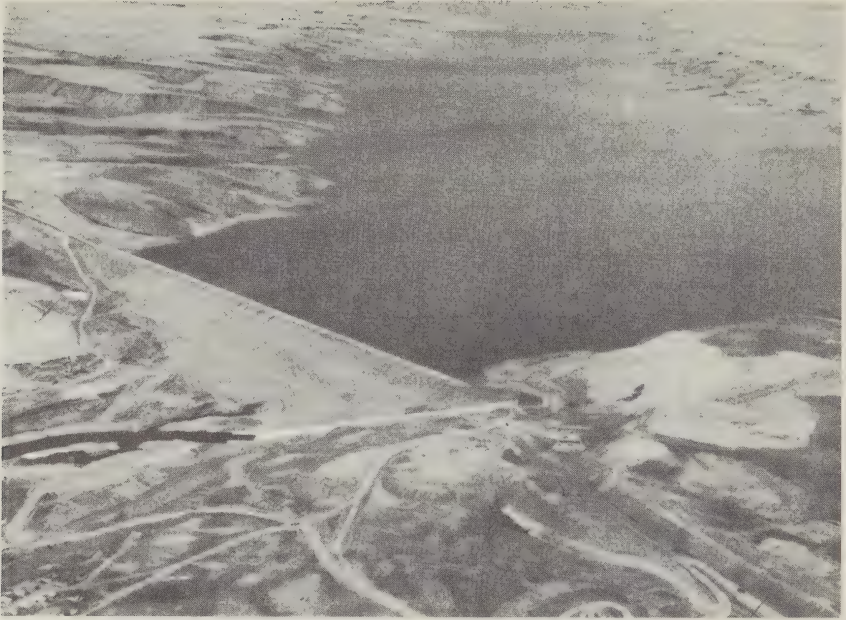
The first water tapped from the Bow River was delivered to the land in 1920. By 1924 the Company was irrigating only 10,600 acres of its original holdings plus 4,501 acres in the New West Irrigation District and receivership proceedings were instituted against it. A receiver was appointed and at his request the Federal Department of the Interior agreed to operate the project until a settlement could be reached. A settlement was finally effected which resulted in agreement between the Federal and Provincial Governments allowing debts to be liquidated by the transfer of lands. This reduced the Company's holdings to approximately 225,700 acres of which 100,000 acres were regarded as irrigable.

In 1927 operations were resumed and by 1930 a total of 30,000 acres were receiving water. The depression of the thirties struck hard at the Company and prevented any further development for a number of years. With the return of more favorable times however, gradual progress was made until the irrigated acreage finally stood at 54,000.

Even at this stage of development the Company was still struggling and after negotiations the Government of Canada agreed in 1950 to purchase the irrigation system for \$2,250,000. From this time the development became known as the Bow River Project.

The Government of Canada through P.F.R.A. has set about the task of renovating, enlarging and redesigning the Company's old system with the ultimate





The Travers Dam and Reservoir. The dam contains 4,500,000 cubic yards of earth, rock and gravel. The reservoir has a useable storage of 100,000 acre feet.

objective of irrigating some 240,000 acres. This has meant the construction of major earth dams, giant siphons, drainage and distribution systems.

Five-hundred and eleven settlers are farming units on the Central Block of the Bow River Project as at March 31, 1954. Two hundred and seventy-five settlers have completed payments in respect of their Agreements for Sale while 212 settlers hold their units under Agreements for Sale and are paying on such agreements on a crop-share basis.

Twenty-four settlers farm units on a Lease Agreement under the terms of which a settler farms a unit for two years before entering into an agreement for sale.

The project is situated in the driest and warmest section of Alberta and contains soils of excellent quality for the growing of corn, beans and various seeds when irrigated. In the past, production has been largely grain crops but in recent years the raising and feeding of livestock, including sheep, plus the growing of corn crops and seed is becoming general. Potatoes are a major crop in the Vauxhall area.

Water from the Bow River which is tapped near Carseland to the east of the

City of Calgary is the source of supply. The main canal flows southeast for 45 miles (see map) to Lake McGregor, which acts as a storage reservoir, and east from this point via the Travers and Little Bow Reservoirs until it reaches the Western and Central blocks. Beyond Ronalane to the east of the Bow River and running as far as Medicine Hat is the Eastern Block of the project. To date construction has been confined to the Central and Western Blocks.

The cover of this report shows pictorially the recent developments on the Bow River Project and the remainder of this section will be concerned with the progress achieved over the 1953-54 fiscal year.



The spillway of Travers Dam during construction. The completed structure is 958 feet long and has a capacity of 7,700 cubic feet per second.

## CONSTRUCTION

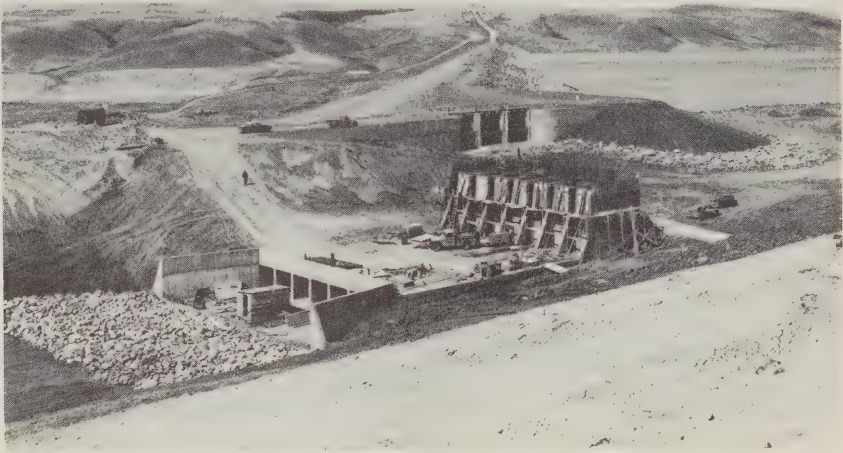
The cool wet spring of 1953 resulted in a slow start on construction work but improved conditions through the season, coupled with a very favorable fall, resulted in excellent progress.

Approximately 34 miles of main canal were enlarged and renovated in addition to the completion of the main canal between Lake McGregor and Travers Reservoir. The canal between Travers Reservoir and the Little Bow Reservoir is also close to completion.

A total of six major, reinforced-concrete, drop-and check-structures were constructed and three ten-foot multiplate culverts were installed on the main canal to provide a highway crossing west of Milo. Two pre-cast concrete bridges were also erected.

During the year some deterioration of the north dam at Carseland was noted. An earth-fill coffer dam was placed behind the original structure and an examination of the footings is proceeding.

At Lake McGregor the outlet structure on the south dam was completed in April 1953 with the installation of five additional gates and vent pipes.



Travers Dam nearing completion. This view shows the spillway control gates in place and the main supply canal control gates under construction.

With the exception of placing a small amount of rip-rap the work on Travers Dam is now completed and the reservoir will be operating in the 1954 season. Complete statistics of the dam and reservoir will be found in appendix VIII.

#### DRAINAGE

During the year the drainage program started in 1952 was continued. Some of the large main drains were started and completed in 1953. The main drain to the Oldman River was extended back into the lakes north of Vauxhall for a distance



of four miles. The lake levels are now much lower and another season's work should see a major change in levels.

Small drains were dug throughout the Vauxhall district allowing farmers to drain low-lying portions of their property. In total 32.4 miles of open drains were excavated involving the movement of 371,381 cubic yards of earth. Approximately three miles of tile drain were put in.

### OPERATION AND MAINTENANCE

The rainfall was about four inches above normal during 1953 though not so well spaced as in 1952. A heavy rain in June eliminated the need for irrigation on many grain crops.

Water deliveries were made to 315 farm units, 60 of which were new holdings in the Hays area. A total of 16,938 acre feet of water was delivered compared with the 20,722 acre feet of 1952 and the peak of 56,677 acre feet of 1949.



The West Arrowwood Creek siphons on the Bow River Project. These wood-stave pipes are eight and one half feet in diameter.



Operation and maintenance crews had a very active year. A total of 268 new structures were built including 23 bridges and culverts for open drains. These structures required 1,203 cubic yards of concrete, 2,000 lineal feet of culvert pipe and 111,121 f.b.m. of lumber. A further 58 structures were repaired requiring 102 lineal feet of culvert and 8,335 f.b.m. of lumber.

Major repairs are in progress on the West Arrowwood Siphon where concrete cradles are being replaced with concrete pedestals and treated timber cradles.

The new ditch rider houses were built during the year.

## RESETTLEMENT AND ECONOMIC PROGRESS

The completion of the Travers Reservoir will open the way to more rapid resettlement previously hampered through lack of water for irrigation.

During the year 17 veterans were allocated land in the Hays district and in the spring of 1953 seven farmers from Saskatchewan were resettled.

Twenty-five parcels of land have been added to the Vauxhall area during the year. Applications have been received for these and it is expected that the land will be allocated before the end of the fiscal year. A further 5,681 acres in the Hays area were broken with the Noble blade and double disked once. Rough levelling and farm fills were put in on 40 parcels. There are now 147 settlers located in the Hays area. These people cropped 6,725 acres in 1953. Yields of grains and forage crops were good for the year 1953 and it is encouraging to see the livestock development by the new settlers on the project.

During the year the hamlet of Hays made a good start. The sale of lots was encouraging and those who purchased them appeared bent on development. There are now two garages, a lumber yard, a restaurant and two general stores in operation. In addition the Alberta Pool Elevators built an 83,000 bushel elevator, which is now in operation and the Canadian Pacific Railway put in a siding, loading platform, stockyards and station. During the year oil and gas were discovered in the Hays district.

At Vauxhall steady growth in the town is observable. The post office and bank have moved into newly constructed buildings. Nine homes have been constructed this past year under the National Housing Act along with numerous other new homes and considerable improvements on old homes. A new hardware store along with two other new business establishments are at the present under construction and will open during 1954.

A modern \$210,000. ten-room school has been constructed in the town; artificial ice has been installed in the curling rink; five new churches have been constructed, and a local service club are constructing a large park and playground along with a swimming pool.



A settler under the Veterans' Land Act successfully winters a small flock of sheep on the Hays district of the Bow River Project.

There has been a general improvement in existing services at Vauxhall with the installation of a modern water-sewage and telephone system.

#### COLLECTIONS ON CONTRACTS

Despite the quotas that have been in effect as well as the recession in live-stock prices, collections on land contracts have been gratifying. There has been a real attempt on the part of the farmers on the project to clear up their indebtedness.

#### THE ST. MARY IRRIGATION PROJECT

The St. Mary Reservoir, now in its third year of operation provided 196,000 acre feet of water to approximately 135,000 acres. Most of this was applied in late summer and early fall when the weather became very dry following a wet June. This wet period drowned out nearly 10 per cent of some specialized crops but the later warm, dry weather resulted in good yields.

The livestock feeding and finishing industry continued to flourish in the irrigated areas during 1953. Some 48,000 ~~beef~~ cattle were fattened on the project as well as 30,000 lambs.

**beef**



Ample feed supplies from the irrigated areas of the Bow River Project mean healthy, well-conditioned stock. These cattle belong to a new settler in the Hays district.

The following table lists some of the specialized crops grown on the St. Mary Project in 1953:

<u>Crop</u>	<u>Acreage Harvested.</u>	<u>Average Yield per acre.</u>
Sugar beet	22, 185	1.25 tons
Canning corn	2, 650	4.0 tons
Ear Corn	550	2.0 tons
Canning Peas	3, 980	2.3 tons
Seed Peas	1, 700	1, 100 pounds
Canning Beans	460	2.7 tons
Cucumbers	320	6.0 tons
Potatoes	1, 800	6.0 tons

Of the 135, 000 acres irrigated in 1953 only 15, 000 acres was new land. While a total of 40, 000 acres of new land was provided with distribution works not all of this area could be served because some portions of the main canal were unfinished.

During the year the main canal was completed to Medicine Hat and work progressed on the Ridge and Chin Reservoirs. The Rattlesnake and Murray reservoirs were completed and all four are now in operating condition.





Land levelling operations in the Taber area on the St. Mary Irrigation Project.

Distribution works on an additional 56,000 acres were installed in 1953 making a total of 96,000 acres of new land ready to receive water in the spring of 1954. Construction work was also started on distributary works for a further 21,000 acres. With the completion of this tract by midsummer of 1954 the St. Mary Reservoir will be able to serve 227,000 acres. The ultimate development envisages the irrigation of approximately 500,000 acres.

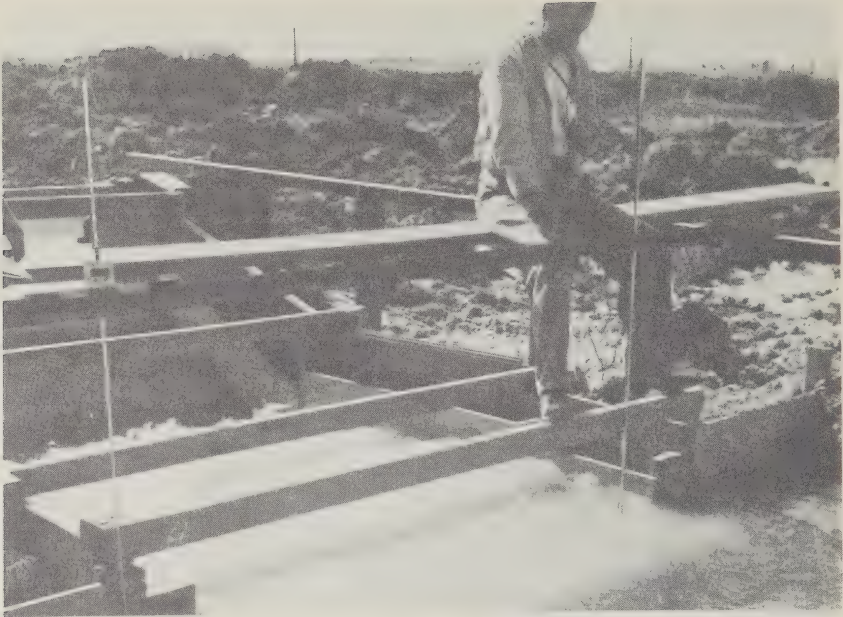
Expenditures from the inception of the project up to March 31, 1954 in accordance with the agreement between the two Governments are approximately as follows:

Government of Canada (through P.F.R.A.)	\$14,001,000.00
Government of Alberta	\$12,065,000.00

As provided in the agreement all the engineering on the project has been done by P.F.R.A. This applies as well to those works financed by Alberta. Planning and design work has been carried out in the P.F.R.A. Project Office in Lethbridge with aid from the various divisions of the P.F.R.A. Engineering Services.

Model-testing work on a new type of canal drop structure was initiated on an irrigation canal near Lethbridge in 1949. These investigations resulted in the





A scale model of a new type of canal drop-structure being tested on an irrigation canal near Lethbridge. These investigations resulted in the development of a superior type of canal drop-structure now used extensively on other P.F.R.A. projects.

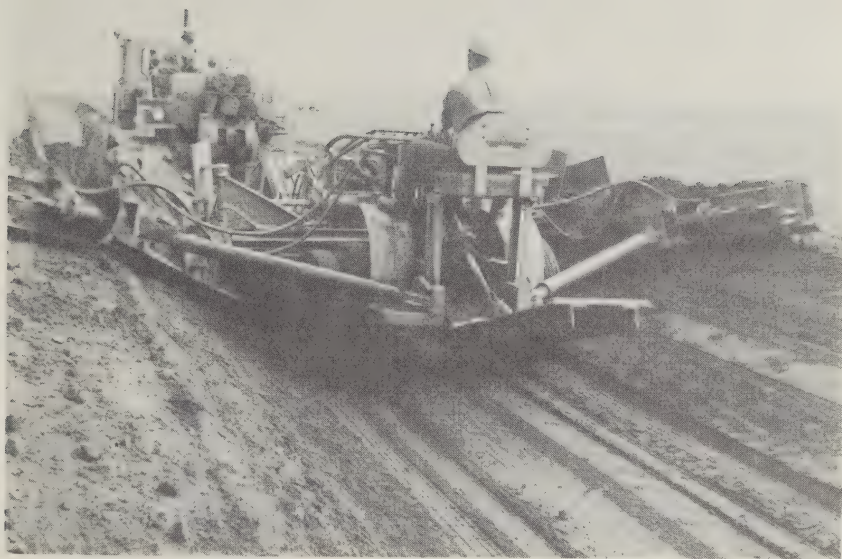
development of a superior type of structure which has since been adopted extensively on other P.F.R.A. projects as well as the St. Mary.

Current demands for water are now approaching the capacity of the St. Mary River and plans for the diversion of the Belly and Waterton Rivers have been proceeding. While a large engineering force has been required to design and supervise immediate construction, long range planning and investigation of remaining portions of the project has not been neglected.

#### SOUTH SASKATCHEWAN RIVER PROJECT

During 1953 field work involving further surveying, hydrographic investigations and drilling and foundation investigations was carried out. Planning and designing relative to the project has been carried on in the Design Division in Regina during the year.

Survey work consisted chiefly of extending the mapping of the proposed irrigable area in the northwestern portion of the project. Approximately 90,000 acres of topography at 400 feet to the inch with five-foot contours was taken in this area. Surveying in other parts of the project brought the total topography for



A new type of hydraulic ditching machine in operation on the St. Mary Irrigation Project.

the year up to 106,500 acres. Considerably more work took place in the Qu'Appelle Valley than in 1952. A large number of drill holes were tied in and some work was carried out on four base lines crossing this valley. Further work involving the tying in of section corners for the Buffalo Pound Lake aerial mapping was also completed, while at the Coteau Damsite a precise chained co-ordinate grid was commenced.

The summer flood in June 1953 was the largest experienced in at least 30 years. As a result numerous readings were taken at Outlook and two points at the damsite to establish the slope of the river's surface. A stream flow measurement was recorded near the flood peak and silt samples were also taken. In the Qu'Appelle Valley numerous stream flow readings were taken on the Summit, Ridge and Squaw Creeks as well as at the Eyebrow Lake Outlet.

During the year considerable drilling and foundation investigations were carried out. At the Coteau damsite on the South Saskatchewan River approximately 27 churn drill holes were sunk to determine foundation features for various parts of the proposed dam structure. Twenty-one test pits were excavated to examine pervious material for the dam while 50 auger holes were put down to investigate two sand beds. A further 267 holes were drilled to investigate four possible damsites in the Qu'Appelle Valley.



An aerial view of the South Saskatchewan River at the site of the proposed 40,000,000 cubic yard, earth-fill dam.

### PASQUIA PROJECT

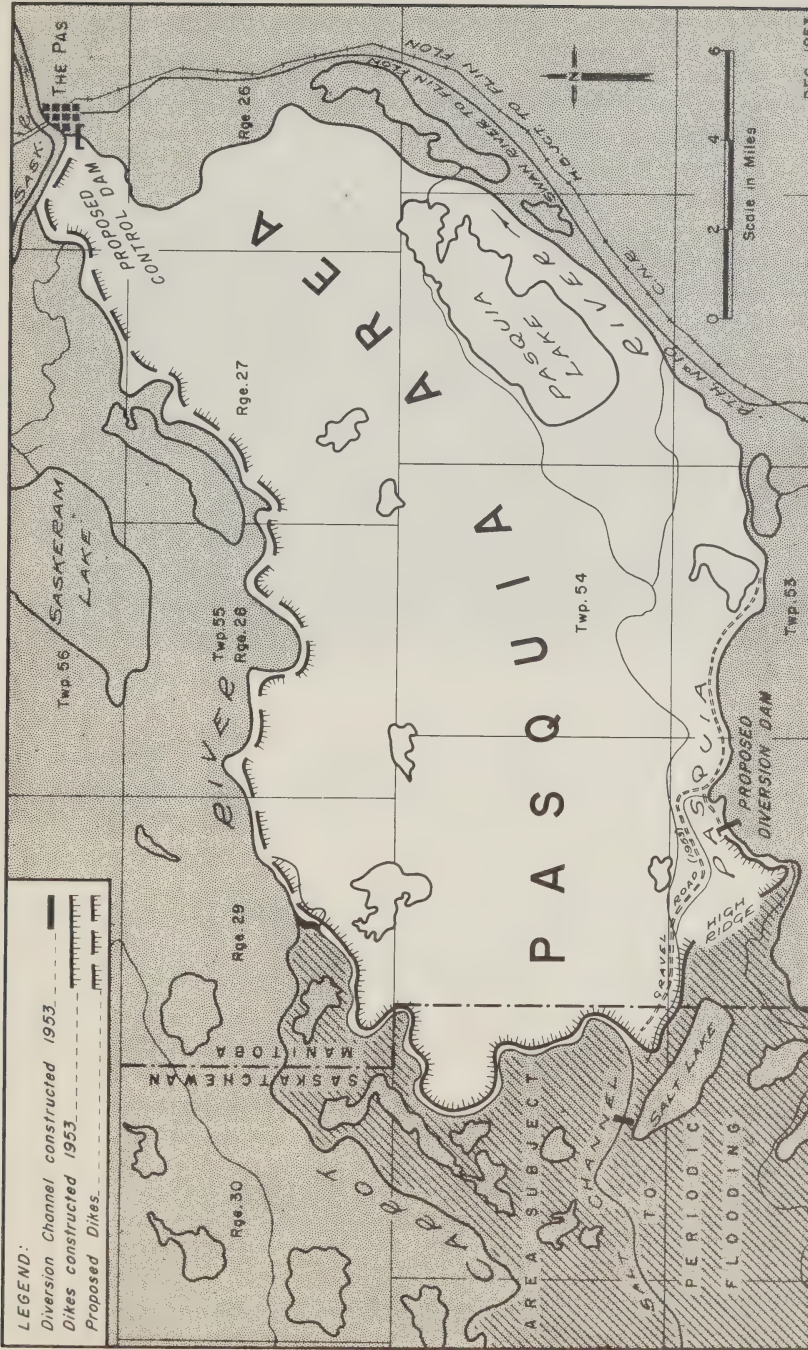
During 1953 under joint agreement with Manitoba the Government of Canada, through P.F.R.A., commenced construction for reclamation in the Pasquia Area. Part of the overall Saskatchewan River Reclamation Project, the Pasquia Area lies to the west of The Pas between the Carrot and Pasquia Rivers.

The plan currently being followed involves a diversion of the Pasquia River to the Carrot River coupled with an extensive diking system paralleling the diversion and the Carrot and Saskatchewan Rivers. (See map.)

By the end of April 1953 the dike location from the proposed Pasquia River diversion dam through to the Carrot River had been partly cleared. During the summer months bush from these operations was burned, repiled, burned again and finally cleared from the right-of-way. In June, actual construction of the dikes was initiated and this work continued through until its completion on December 15. Approximately 19 miles of diking was constructed involving the movement of 850,000 cubic yards of earth. Further sloping and trimming is required on these dikes as a result of the wet conditions at the time of construction.

Much of the Pasquia River - Carrot River Diversion follows the course of the Salt Channel, an old natural drainageway. However, two artificial channels





DEPARTMENT OF AGRICULTURE - CANADA  
 P.F.R.A.

# SASKATCHEWAN RIVER RECLAMATION PROJECT GENERAL PLAN - PASQUIA AREA DEVELOPMENT





An aerial view of portion of the developed farmland in the Pasquia Area.

were required to make the diversion function properly. The first of these involving the excavation of 80,000 cubic yards connected the Salt Lake - Salt Channel - Murphy Lake area while the second cut amounting to 124,000 cubic yards made the final connection between the Salt Channel and the Carrot River.

Due to the inaccessible nature of the project area an access road was built along the Pasquia River from a point three miles west of Westray to the Pasquia River Diversion Damsite and beyond this point to the Salt Channel. This road was also gravelled. A low temporary road was built along the Salt Channel, finally connecting with the Carrot River road. From this point another access road was constructed to gain entry to a large gravel pit close to the Saskatchewan boundary.

A bridge over the Salt Channel - Carrot River Diversion was completed by the end of the fiscal year.

During the construction period numerous culverts and drains were installed and a considerable amount of road grading was done. A 21-inch pump was set up at mile 14 ditch and this was operated during the period of high water.

Two contracts have been let for the construction of the dike to the south of the Carrot River and it is expected that this 23 1/2 miles will be completed by November 1954.



The Salt Channel-Carrot River Diversion Cut with its newly constructed road bridge allowing access to a gravel pit close to the Saskatchewan-Manitoba border. Paralleling the Salt Channel, which curves off to the upper right, is the dike constructed in 1953. The stream in the foreground is the Carrot Rivers.

With respect to the present development of the Pasquia Area the office staff in Winnipeg has been engaged on a study of dike elevations around the reclamation area. Detailed maps were prepared from aerial photos to facilitate planning in the interior. A consultant engineer was engaged to study drainage problems in the Pasquia Area and, after extensive observations in the field along with office studies in Winnipeg, a report on a detailed drainage scheme was submitted.

## OTHER SPECIAL PROJECTS

### BRITISH COLUMBIA PROJECTS

The operation of P.F.R.A. in British Columbia in 1953-54 has been on a Special Project basis. The work has involved the completion of one new project for the Veterans' Land Act as well as assistance in the operation and maintenance of projects previously constructed for the same authority. Plans and specifications were prepared and construction supervised on one Provincial Government Project while a number of projects sponsored by the Provincial Government and the Veterans' Land Act were investigated. Preliminary surveys were also undertaken for the Federal - Provincial Board, Fraser River Basin.

The year's activities in British Columbia are set out as follows:

- (a) Projects completed or under construction.
- (b) Projects under assisted operation and/or maintenance.
- (c) Projects under investigation for the Veterans' Land Act and the Provincial Government.
- (d) Projects under investigation for the Fraser River Basin Board.

Supplementing this material is a key map showing the geographical location and status of all projects.

Those projects which were completed or under construction during the year are as follows:

#### PENTICTON WEST BENCH

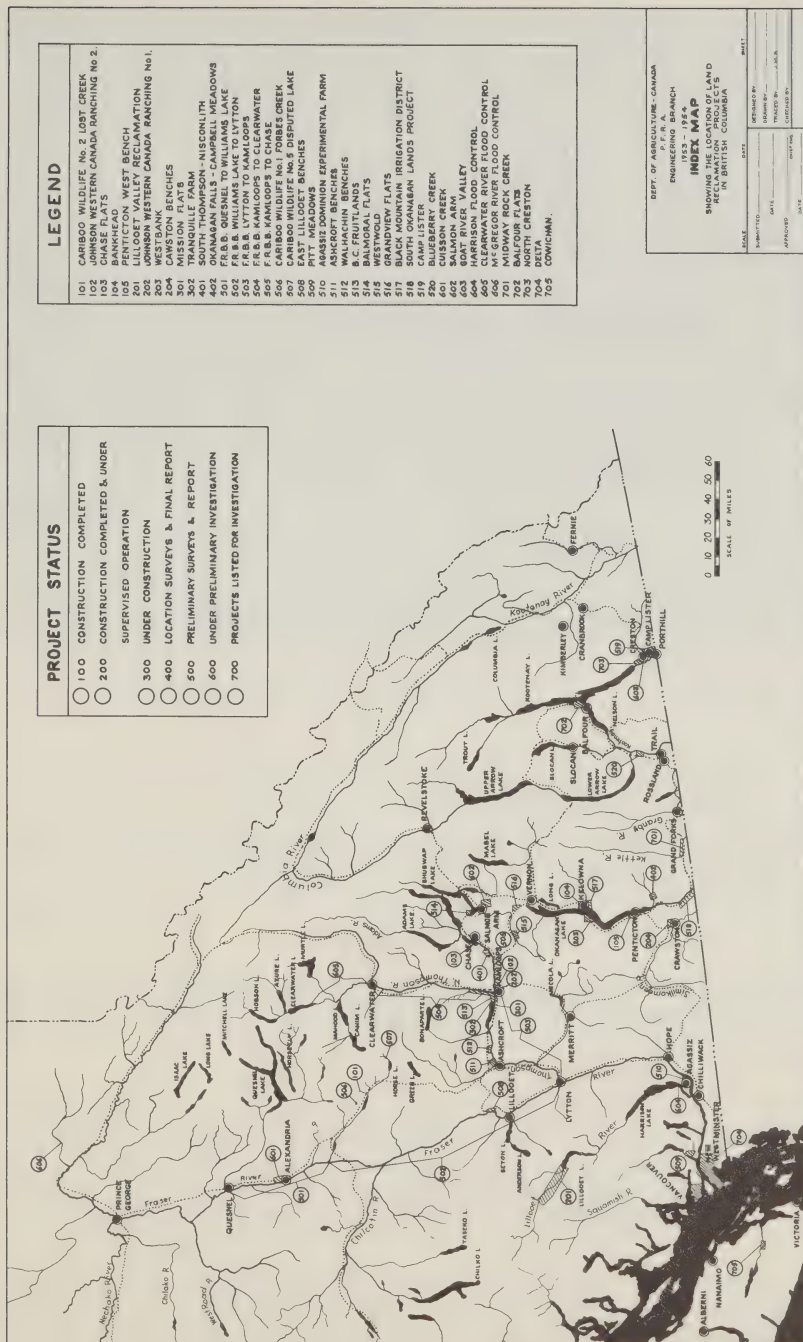
This project serves a series of high bench lands directly west of Penticton. It now consists of 94 small holdings for part-time farming. The total area is 205.5 acres with no holding less than 1.6 acres of arable land.

Water was turned into the system on May 14 but since that time leaks at saddles and threaded pipe joints have needed attention and adjustments have been required on the pumps and automatic controls.

The works consist of a pumping station installed on the Okanagan River, capable of delivering water against a head of 450 feet in a closed pipe system. This water is utilized both for sprinkler irrigation and domestic supply.

#### MISSION FLATS PROJECT

During the year an estimate and report were prepared in relation to the provision of dikes to prevent flooding of the Federal Entomological Laboratory properly near Kamloops; such protection to be effective against floods equal to that of 1948. These dikes, utilizing 20,000 cubic yards of fill material, were constructed in the latter part of the year.







A view of the development of the small irrigated holdings on the Penticton West Bench Project, British Columbia.

A 1,200 foot flume which supplies this area with irrigation water was also reconstructed at cost to that Department.

Those projects which were under assisted operation and/or maintenance during 1953 are as follows:

#### LILLOOET VALLEY RECLAMATION PROJECT

This diking and drainage project protects some 14,000 acres from flooding in the Lillooet Valley at Pemberton. Work was started here in 1946 practically completed in 1952.

During the past season the banks of the lower section of Miller Creek, a tributary of the Lillooet River, were stabilized with 10,600 cubic yards of rock rip-rap. Three hundred and ten cubic yards of the same material were used to reinforce plugs and protect the berms and dikes in area two. This work was completed in the middle of May and P.F.R.A. crews were withdrawn from the area.

The Diking District has assumed responsibility for operation and maintenance of the project during the past year with assistance from P.F.R.A. in the way of engineering advice.



Bank protection work on a section of Miller Creek on the Lillooet Valley Reclamation Project.

## CHASE FLATS

This Veterans' Land Act project is located near the town of Chase on the South Thompson River 35 miles east of Kamloops. Water for this system is diverted from Chase Creek to supply sprinkler irrigation to 611 acres divided into 30 acre full-time, farm holdings. The Irrigation District carried out its own operations during the year.

Assistance was given to the District to improve the intake on Chase Creek. Plans for the structure were prepared and materials were supplied by P.F.R.A. Installation was carried out by the District with the cost of installation being paid by P.F.R.A.

## JOHNSTON - WESTERN CANADA RANCHING NO. 1.

This project, located six miles east of Kamloops, is supplied with water pumped from the South Thompson River. The area of 150 acres is divided into 15 ten-acre, full-time farms.

During the season levels were run over the flume trestle and material for shims was supplied to bring the flume up to grade. The project was operated by the District during the past irrigation season.

A preliminary report and cost estimate on the installation of a pressure system to replace the present gravity scheme was prepared by P.F.R.A. and submitted to the Veterans' Land Act in July. Such a change would allow the re-subdivision into small holdings of side-hill lots and narrow fringe areas adjacent to the saline flats. This would aid in meeting the current demand for small holdings close to Kamloops.

#### WESTBANK IRRIGATION PROJECT

This project, consisting of 1,100 acres paralleling the western shore of Okanagan Lake is now operated by the Lakeview Irrigation District. Settlement of the farms is continuing under the Veterans' Land Act and about 75 per cent of the area, which is divided into 12-acre, full-time farms and 3-acre, small holdings, has been allotted.

Active electrolytic corrosion of the steel pipe on this project developed after one year of use and during the 1952-53 season cathodic protection in the form of impressed direct current through anode beds of steel rails was applied. Inspection has shown that this technique is arresting the corrosion. To protect the system further the two existing anode beds have been extended. Two additional anodes have also been installed along the main line, since examination here has revealed signs of corrosion.

Repair work has also been carried out on the conduit in the Rose Valley Dam. The Rose Valley Reservoir supplies the water for the Westbank Irrigation Project.

#### CAWSTON BENCHES (FAIRVIEW) IRRIGATION PROJECT

Operated by the Fairview Heights Irrigation District and located south of Keremeos, is the Cawston Benches Irrigation Project. Water is supplied by pumps from the Similkameen River to a closed-pressure, wood-stave pipe system for sprinkler irrigation and for domestic use on 624 acres.

During the year an additional 100 h.p. pump was installed to assist the District in a more economical operation of the system.

During 1953 seven projects were under investigation for the Veteran's Land Act and the Provincial Government. Surveys, cost estimates and reports have been, or are currently being, completed on the following projects; British Columbia Fruitlands Irrigation, Grandview Flats, Camp Lister, Black Mountain Irrigation District, Cuisson Creek, Salmon Arm and Blueberry Creek.

Three projects relating to investigations for the Federal-Provincial Board, Fraser River Basin were carried out during the year.

The Harrison Lake Damsite was the scene of further washboring and drilling as well as pumping tests to determine the permeability of the foundation material.





The silting basin at the pumphouse on the Cawston Benches Project.

All information on this work has been forwarded to the Soil Mechanics and Materials Division in Saskatoon, which has been responsible for directing the work.

P.F.R.A. surveys parties during the past summer were engaged in establishing the location and elevation of photo control points in the Upper Clearwater River and Mahood Lake area. These points are to be used in the preparation of contour maps from air photos for future use in studying the flood control and power potential of the Clearwater River.

In the late fall a survey was started to determine the storage capacity of a possible flood control and power damsite on the McGregor River. This stream is a tributary of the Fraser which it joins just above Prince George.

### MANITOBA PROJECTS

#### RIDING MOUNTAIN PROJECT

The 1953 spring runoff in the Riding Mountain area was particularly violent and this was followed by a flood during the first week of June. This flood presented an excellent opportunity for the observation of the behaviour of P.F.R.A.-constructed control works under conditions of above-normal discharge. These facilities passed the flood peak without damage, other than some localized scour or erosion. The flood caused serious damage, however, to large sections of the Riding



Mountain Project area which were not protected. Municipal roads, ditches, bridges and culverts were particularly hard hit. The prolonged wet spring coupled with the flood served to make 1953 one of the poorest years for grain farming on record in the region.

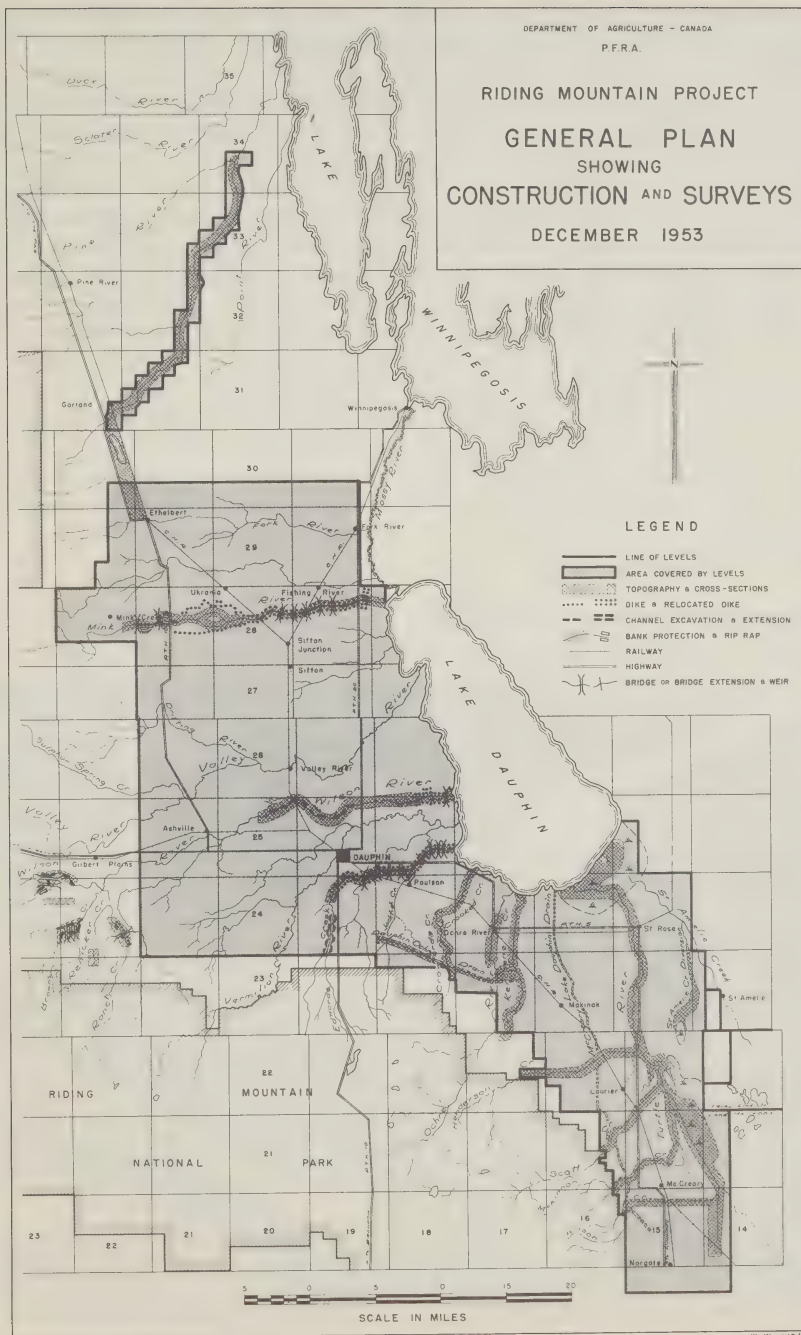
Surveys during the year included the completion of a topographical survey of McKinnon Creek started in 1952. Approximately 400 miles of section levels were run in the Turtle River Basin while levels, base line and cross-sections were taken in relation to a proposed diversion of the Turtle River into Ste. Amelie Creek. In the Duck Mountain Forest Reserve a topographical survey was conducted at a proposed damsite on the Valley River. A small survey party was retained in Dauphin from June 24 to November 15 for surveys connected with the construction program.

Construction work began in July and continued until late December. In contrast to the wet spring a mild, open fall followed a fine, dry summer. Good progress was made on all jobs and by Christmas the proposed program was largely completed.

On the Dauphin section of the Wilson River Project one and one quarter miles of diking in four separate areas was realigned, raised or constructed. Dragline waste dumps thrown up in 1952 were spread out and one eroding bank was protected. Three culverts were installed and a steel truss bridge was completed.



A section of newly-constructed diking along the south side of the Wilson River in the Rural Municipality of Dauphin. These areas were later seeded to grass.



Six new timber bridges crossing the Wilson River, Brown's Creek and Ranch Creek were completed in the Gilbert Plains section of the Wilson River Project. Dragline dumps were levelled and two reaches of stream channel were cleared and improved while rip-rap bank protection was completed on an 800 foot bank of the south branch of the Wilson River. Minor seeding operations were carried out on dikes in both sections of the Wilson River Project.

The major work on the Edwards Creek Project during 1953 was the extension and improvement of eight timber bridges. In addition to this a weir was constructed on the improved channel to prevent further downward cutting of the stream bed near the #5 highway bridge. Approximately 1,200 feet of rip-rap bank protection was completed at the Jackfish and Edwards Creek floodway confluence.

On the Mink Creek Project the bulk of the season's work consisted of sloping and rip-rapping approximately one-half mile of bank upstream from highway #10. Other minor improvement work involving the construction of 1,500 feet of double diking, channel cleaning and the excavation of a 600-foot cut-off, was also carried out.

#### ASSINIBOINE RIVER PROJECT

During the 1953 season which extended from August to November over nine miles of new diking was constructed in the Portage la Prairie-Poplar Point region.



A cut-off on the Assiniboine River in the Poplar Point area of Manitoba constructed for flood control purposes.



These dikes having a ten foot top with 2 1/2: 1 side slopes represent a continuation of the work taken over from the Canada Department of Public Works in 1950.

As a result of requests from farmers in the Portage la Prairie to Winnipeg reach of the Assiniboine River surveys were made in the fall of 1952 to determine the feasibility of excavating three cutoffs. During this season two of these cutoffs were constructed. The Abraham Cutoff in the Municipality of St. Francois Xavier involved the excavation of about 60,000 cubic yards of earth and required ten acres of clearing. The Rivard Cutoff in the Municipality of Cartier required the removal of 76,000 cubic yards of earth and the clearing of 18 acres.

Gray's Cutoff at Brandon is now functioning very efficiently and channel deepening is expected to continue for some time.

#### PIPESTONE CREEK - OAK LAKE SURVEY

The area lying between Pipestone Creek and Oak Lake in townships seven and eight ranges 25 and 26 has been subject to damaging floods during recent years. The Municipalities of Pipestone, Sifton and Glenwood are directly affected in varying degrees.

A survey to evaluate the problem was started on June 10th and extended through to September 30th. In this period 35 square miles of topography was completed between Pipestone Creek and Oak Lake and cross sections were taken every 600 feet along the Pipestone Creek.



APPENDIX I

Cumulative Statement  
Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act

1938 to March 31, 1954

Fiscal Year	No. of Pasture Units in Operation	Area of Pastures in Operation (acres)	Total Cost of Construction of Pastures in Operation	Livestock Units Carried on Pastures x	Acres per unit of live stock	Cost of Operation		Net Operating Cost per Unit of Livestock	Average Charge per Unit Livestock to Farmers
						Revenue	Operating Costs		
			\$			\$	\$	\$	\$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,251,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
						3,084,561.40	2,532,942.65		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.

- A pasture unit may include one or more pastures, but it is operated under one management.

P. F. R. A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1953-54.

Community Pasture and Headquarters	Area of Pasture Fenced (acres)	Accumulated Cost of Construction Mar. 31/53	Accumulated Cost of Construction Mar. 31/54	1953-54 Stock Pastured Cattle Horses
Pasture Operating Units - Saskatchewan				
Coalfields #4, North Portal	25,440	102,189.57	108,156.55	1,194 53
Estevan-Cambria #5 and 6, Macoun	6,720	14,246.95	14,246.95	555 2
Masefield #17, Orkney	33,120	82,638.79	83,696.81	1,340 19
Lone Tree #18, Bracken	32,480	64,110.46	66,893.88	1,205 52
Battle Creek #20, Divide	65,760	100,978.12	100,978.12	2,079 14
Nashlyn #21, Consul	60,936	64,654.31	64,654.31	1,632 7
Govenlock #22, Govenlock	66,360	77,729.14	81,150.14	1,894 1
Lomond #37, pasture #1, Goodwater	23,360	51,047.33	51,047.33	1,857 85
Lomond #37, pasture #3, Maxim	18,400	61,608.58	62,043.41	1,876 64
Laurier #38, Lomond #3 #2, Radville	37,120	67,495.73	69,147.67	2,543 151
The Gap #39, Hardy	12,000	38,955.62	38,955.62	1,231 30
Val Marie #47, Val Marie	155,680	219,218.55	219,218.55	5,072 4
Beaver Valley #47A, Beaver Valley	11,360	23,956.95	23,956.95	779 2
Reno #51, pasture #1, Robsart	16,160	31,004.33	31,822.33	1,164 15
Reno #51, pasture #2, Consul	10,480	21,364.39	23,784.94	708 5
Tecumseh #65, Forget	18,560	52,465.26	52,854.37	2,270 67
Brokenshell #68, pasture #1, Yellow Grass	20,960	38,687.77	39,600.77	1,369 50
Brokenshell #68, pasture #2, Weyburn	8,160	13,583.47	13,583.47	587 58
Excel-Key West #71-70, Ormiston	31,200	57,633.64	63,335.44	3,160 84
Auvergne-Wise Creek #76-77, Ponteix	40,480	101,589.90	102,227.44	2,841 20
Wellington #97, Tyvan	25,520	78,713.39	84,711.62	3,390 114
Caledonia-Elmsthorpe #99-100, Milestone	24,800	95,195.87	97,210.15	1,561 54
Shamrock #134, Shamrock	26,000	72,024.08	72,024.08	2,342 39
Swift Current-Webb #137-8, Beverley	19,040	68,660.84	71,592.16	1,688 14
Gull Lake #139, Tompkins	8,960	23,238.81	23,691.23	410 -
Big Stick #141, Maple Creek	17,760	38,619.17	40,751.77	1,305 -
Bitter Lake #142, Maple Creek	33,760	66,914.60	70,123.29	1,875 -
Spy Hill #152, Welby	20,000	45,281.81	49,268.07	1,465 29
Elbow #223-4, Elbow	29,440	65,562.22	69,323.68	2,518 100
Beaver Hills #245-6, Parkerville	44,160	99,912.14	103,514.62	3,480 252
Willner #253, Rosemae, P.O.	12,800	-	32,278.10	-
Coteau #255, Birsay	27,520	53,390.19	54,941.76	1,461 58
Monet #257, Elrose	46,720	98,753.84	98,753.84	2,856 108
Newcombe #260, Glidden	52,640	111,057.61	119,484.10	2,370 79
Mantario #262, Empress, Alta.	24,480	60,292.62	60,292.62	1,416 -
W-reford #280, Hatfield	12,640	65,041.25	69,395.44	1,148 -
McCraney #282, Davidson	10,720	62,409.55	63,608.76	1,331 -
Rudy-Rosedale #284-3, Broderick	19,040	69,561.33	73,973.68	1,627 67
Hillsburgh #289, Brock	13,760	39,738.16	48,702.87	844 -

Community Pasture and Headquarters		Area of Pasture Fenced (acres)	Accumulated Cost of Construc- tion Mar. 31/53	Accumulated Cost of Construc- tion Mar. 31/54	1953-54 Stock Pastured Cattle Horses
Pasture Operating Units - Saskatchewan - cont'd					
Eagle Lake #289-319, Netherhill	18,640	44,845.37	44,995.37	630	27
Kindersley-Elma #290-1, Smiley	21,280	102,844.24	105,247.09	1,917	96
Usborne #310, Venn	12,720	30,799.46	36,570.38	1,212	32
Dundurn #314, Dundurn	20,560	34,911.13	41,289.60	1,235	-
Montrose #315, Gledhow	20,480	47,681.16	48,836.11	1,291	-
Oakdale #320, Beaufield	20,480	59,554.58	60,346.58	1,102	50
Antelope Park #322, Hoosier	34,720	70,173.82	92,001.41	2,004	104
Wolverine #340, R.R.#1, Burr	16,640	60,761.52	60,761.52	1,738	-
Mariposa #350, Kerrobert	27,360	82,693.92	82,693.92	2,198	108
Progress #351, Kerrobert	19,800	57,535.72	59,021.39	1,568	48
Heart's Hill #352, Compeer, Alta.	15,160	28,094.31	28,094.31	1,241	35
Park #375, Langham	7,040	19,698.22	19,698.22	367	-
Battle River-Cutknife #438-9, Gallivan	31,200	69,131.48	72,576.30	1,117	72
Royal #465, Lorenzo	65,220	106,823.14	146,204.20	1,794	5
Paynton #470, Paynton	23,360	67,074.23	67,074.23	1,331	75
Totals for Saskatchewan			3,383,139.34	3,580,407.41	89,188 2,349
Special Projects - Nashlyn Bull Station included in Nashlyn Pasture Bitter Lake Irrigation included in Bitter Lake Pasture					
Pasture Operating Units - Manitoba					
Archie pasture, Welwyn	40,340	80,761.06	80,761.06	2,290	23
Ellice pasture, Welby	20,320	27,614.80	27,614.80	1,465	29
Portage pasture, Poplar Point	14,640	39,118.24	39,347.92	3,509	142
Woodlands pasture, Poplar Point	20,960	57,027.80	61,745.25	3,063	528
Lakeview pasture, Langruth	29,280	72,105.40	77,337.63	3,069	26
Westbourne pasture, Gladstone	11,520	35,669.34	36,566.33	1,824	43
Longford pasture, Oberon	19,040	58,662.43	59,792.43	1,971	64
Wallace pasture, Elkhorn	3,280	(Operated by R. M. Wallace)			
Totals for Manitoba			370,959.07	383,165.42	17,191 855
Grand Totals			3,754,098.41	3,963,572.83	106,379 3,204

N. B. The column showing "Accumulated Construction Costs to Mar. 31/53" replaces that in the 1952-53 Annual Report which contained errors of computation.

# APPENDIX III

## PRAIRIE FARM REHABILITATION ACT

showing number of projects and amount of financial assistance paid since the inauguration of program to March 31, 1954

Province & Classification	DUGOUTS			STOCKWATERING			IRRIGATION SCHEMES			TOTALS	
	Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid
<b>MANITOBA</b>											
Individual	10, 206	1, 005, 256.73	300		21, 867.79	112		34, 206.49		10, 618	1, 061, 331.01
Neigh. & Comm.	43	8, 382.98	26		20, 449.43	4		1, 060.15		73	29, 892.56
Total	10, 249	1, 013, 639.71	326		42, 317.22	116		35, 266.64		10, 691	1, 091, 223.57
<b>SASKATCHEWAN</b>											
Individual	27, 283	3, 028, 168.43	3, 791		321, 601.89	1, 798		417, 345.28		32, 872	3, 767, 115.60
Neigh. & Comm.	415	175, 036.27	142		99, 002.93	65		27, 146.19		622	301, 185.39
Total	27, 698	3, 203, 204.70	3, 933		420, 604.82	1, 863		444, 491.47		33, 494	4, 068, 300.99
<b>ALBERTA</b>											
Individual	2, 997	310, 450.60	1, 895		174, 701.56	841		194, 112.69		5, 733	679, 264.85
Neigh. & Comm.	28	8, 229.34	42		27, 018.37	17		12, 402.30		87	47, 650.01
Total	3, 025	318, 679.94	1, 937		201, 719.93	858		206, 514.99		5, 820	726, 914.86
<b>GRAND TOTAL</b>											
	40, 972	4, 535, 524.35	6, 196		664, 641.97	2, 837		686, 273.10		50, 005	5, 886, 439.42



# APPENDIX IV

## Progress by Years in the Construction of Small Projects

(Individual and Neighbour)  
P.F.R.A. Water Development Program  
1935 to March 31, 1954

Fiscal Year	Number of Projects Constructed			Financial Assistance Paid on Projects				
	(1) DO	SWD	IRR	Total	DO	SWD	IRR	Total
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	473	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08
1952-53	861	119	288	1,268	100,219.54	13,382.92	92,397.46	205,999.92
1953-54	1,774	178	181	2,133	204,148.93	18,373.83	46,550.99	269,073.75
40,972	6,196	2,837	50,005	664,641.97	4,535,524.35	686,273.10	5,886,439.42	

(1) DO - Dugout, SWD - Stockwatering Dam Irr - Individual Irrigation Project.

## APPENDIX V

## WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS

To March 31, 1954

## MANITOBA

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
1	Crystal City Storage	Crystal City	Stockwatering	1935	---	3	3,334.00
2	Edwards R.M. of	Melita	"	1935	---	100	10,214.00
3	Town of Souris	Souris	"	1935	---	150	3,841.00
4	Clear Water Storage	Clear Water	"	1938	---	12	5,949.00
5	Brandon Water Supply	Brandon	Storage	1940	---	500	3,996.00
6	Morris River-Rock Lake	Carman	Stockwatering	1940	---	10,000	23,401.00
7	Dead Horse Creek Dam	Morden	Irr. & Stockwatering	1941	100	1,200	49,891.00
8	La Salle River Dams	La Salle	Stockwatering	1941	---	900	22,989.00
9	Hartney	Hartney	Irr. & Stockwatering	1941	---	---	(10,264.00
10	Melita	Melita	"	1941	3,900	3,200	(11,372.00
11	Napinka	Napinka	"	1941	---	---	(6,770.00
12	Wawanesa	Wawanesa	"	1941	---	---	15,457.00
13	Whitemud River Storage	Gladstone	Stockwatering	1943	---	660	11,464.00
14	Alexander Soil Conservation	Alexander	Soil Conservation	1944	---	---	5,250.00
15	Little Souris River Dam	Melita	Stockwatering	1945	---	250	1,380.00
16	Birtle Dam	Birtle	Stockwatering	1947	---	---	11,490.00
17	Westbourne R.M. of	Gladstone	"	1947	---	---	5,993.00
18	Rosebank Dam	Rosebank	Stockwatering	1948	---	32	12,161.00
19	Shoal Lake Project	Shoal Lake	"	1948	---	3,500	8,491.00
20	St. Lazare Storage Res.	Lazare	"	1948	---	5	1,470.00
21	Brandon Flood Irr.	Brandon	Flood Irrigation	1949	1,000	---	27,107.00
22	Whitemud River	Woodside	Stockwatering	1949	---	160	6,506.00
23	Dead Lake Community	Gladstone	Irr. & Stockwatering	1950	20	90	1,933.00
24	Minnedosa Dam	Minnedosa	Storage	1950	20	1,500	105,051.00
12	Wawanesa	Wawanesa	Irr. & Stockwatering	1952	---	---	109,875.00
3	Town of Souris	Souris	Stockwatering	1953	---	---	72,996.00
7	Dead Horse Creek	Morden	Irr. & Stockwatering	1953	---	---	294,356.00
8	Hogue Dam	Sanford	Stockwatering	1953	---	---	29,183.00
25	Park Lake	"	"	1953	---	---	21,626.00
26	Deloraine	Neepawa	"	1953	---	---	770.00
27	Waskada	Deloraine	"	1953	---	1.5	853.00

SASKATCHEWAN

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
1	Adams Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
2	Lajord	Lajord	Flood Control	1936	---	300	13,800.00
3	Val Marie	Val Marie	Irrigation	1937	5,500	7,000	214,558.00
4	Middle Creek	Battle Creek	"	1937	1,000	20,000	18,663.00
5	Davidson	Davidson	Irr. & Stockwatering	1937	100	277	3,114.00
6	Dunn & Watt	Mankota	Irrigation	1937	305	---	2,996.00
7	Moose Mountain	Corning	"	1937	---	8,000	14,829.00
8	Girvin	Girvin	Stockwatering	1937	---	19	2,180.00
9	Lac Pelletier	Lac Pelletier	"	1937	---	3,350	2,139.00
10	McCraney, R.M. of	Kenaston	"	1937	---	350	1,896.00
11	Roughbark Creek	Goodwater	"	1937	---	1,500	9,314.00
12	Maple Creek	Maple Creek	Irr. & Stockwatering	1938	4,500	23,260	356,179.00
13	Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618.00
14	Lake of the Rivers	Assiniboia	Stockwatering	1938	---	300	10,805.00
15	Long Creek #1	Estevan	"	1938	---	137	8,729.00
16	Long Creek #2	Estevan	"	1938	---	90	8,701.00
17	Masefield	Masefield	"	1938	---	40	3,187.00
18	Pipestone Lake	Broadview	"	1938	---	1,600	11,785.00
19	Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
20	Cypress Storage	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
21	Big Arm Storage	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
22	Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
23	Arcola	Arcola	Stockwatering	1939	---	Under- Ground	17,310.00
24	Val Marie West	Val Marie	Irrigation	1940	3,500	2,000	150,639.00
25	Lafleche	Lafleche	Stockwatering	1940	---	38	2,525.00
26	Saskatoon	Saskatoon	Storage	1940	---	1,200	290,446.00
27	Weyburn	Weyburn	Flood Irrigation	1940	---	4,000	51,311.00
28	Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	*	---	83,723.00
29	Battleford	North Battleford	Irrigation (Pump)	1941	800	---	3,058.00
30	Dead Lake	Macoun	Irr. & Stockwatering	1941	Souris River Development	---	(17,528.00)
31	Oxbow	Oxbow	" " "	1941	3,900	3,200	(17,436.00)
32	Souris-Estevan	Estevan	" " "	1941	---	---	(91,133.00)
33	Canora	Canora	Storage	1941	*	300	16,128.00
34	Crooked & Round Lake	Qu'Appelle Valley	Irrigation	1941	*	---	48,650.00
35	Fairhill	"	"	1941	*	---	4,302.00
36	Lebret	"	"	1941	*	---	16,307.00
37	Last Mountain Lake	"	"	1941	*	---	42,271.00
38	Tantallon	Tantallon	Stockwatering	1942	---	---	2,790.00
39	Wood River Development	Coderre and Gravelbourg	"	1942	---	4,923	33,738.00

Name of project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feed	Costs
Jackfish Creek	40	Meota	Stockwatering	1943	---	90	2,940.00
Craven Dam	41	Qu'Appelle Valley	Irrigation	1943	*	---	33,675.00
Echo Lake	42	"	"	1943	*	---	41,753.00
Caron Water Development	43	Thunder Creek	Stor. & Stockwatering	1944	---	43,500	701,433.00
Cadillac	44	Cadillac	Irr. & Stockwatering	1945	800	1,350	32,887.00
Wolverine Creek	45	Humboldt	Stockwatering	1945	---	522	52,600.00
Look Creek	46	Markinch	"	1945	---	700	7,180.00
* - Ultimate irrigation development for all projects along Qu'Appelle River Valley - 30,000. (Total storage capacity - 95,600 acre feet.)							
Richardson - McKinnon	47	Consul	Irrigation	1946	3,000	---	53,913.00
Swift Current	48	Swift Current	Irr. & Stockwatering	1946	30,000	95,000	816,472.00
Beechy #1	49	Beechy	"	1946	600	1,000	12,746.00
Matador	50	Matador	"	1946	120	220	5,216.00
Bracken	51	Bracken	Stockwatering	1946	---	158	1,001.00
Eagle Hill Creek	52	Plenty	Stockwatering	1946	---	10,700	6,432.00
Hanley	53	Hanley	"	1946	---	60	3,797.00
Lucky Lake	54	Lucky Lake	"	1946	---	120	7,596.00
Frenchville	55	Frenchville	Irr. & Stockwatering	1947	430	670	8,096.00
Gravelbourg Storage	56	Gravelbourg	Irrigation	1947	500	---	1,917.00
Coronach	57	Coronach	Irr. & Stockwatering	1947	300	1,450	97,807.00
Wittrock	58	Frenchville	Irrigation	1947	520	---	3,884.00
Cedoux	59	Cedoux	Stockwatering	1947	---	314	4,999.00
Davin	60	Kronau	"	1947	---	1,080	13,501.00
Jumping Deer Creek	61	Lipton	"	1947	---	145	6,092.00
Kaposvar	62	Stockholm	"	1947	---	290	11,946.00
Kelfield	63	Kelfield	"	1947	---	25	4,927.00
Radville	64	Redville	"	1947	---	32	5,019.00
Shrimp Lake	65	Herschel	"	1947	---	450	9,367.00
Tyvan	66	Tyvan	"	1947	---	1,000	11,986.00
Wynyard	67	Wynyard	"	1947	---	35	6,225.00
Spangler Project	68	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Gravelbourg South	69	Gravelbourg	"	1948	600	1,500	8,186.00
Beechy #2	70	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
March Flood Irrigation	71	Cedoux	Irrigation	1948	400	---	1,765.00
Pike Lake	72	Vanscoy	Irr. & Stockwatering	1948	900	2,500	7,360.00
Rosedale	73	Hanley	Irrigation	1948	60	100	1,016.00
Sherwood	74	Regina	Dugout (Irrigation)	1948	20	3	697.00
Talmage	75	Cedoux	Irrigation	1948	1,600	---	3,483.00
Allan	76	Allan	Stockwatering	1948	---	300	4,477.00
Boharm	77	Boharm	"	1948	---	100	6,250.00
Balcarres	78	Balcarres	"	1948	---	100	7,203.00
Cabri	79	Cabri	"	1948	---	340	37,553.00
Gooseberry Lake	80	Corning	"	1948	---	2,500	8,783.00



Name of Project	Ref. No.	Location	Type of Project	Completed Irr. Ac.	Stor. Cap. Acre Feet	Costs
Glenside	81	Glenside	Stockwatering	1948	150	3,286.00
Mine Coulee	82	Neptune	"	1948	40	4,377.00
North Qu' Appelle	83	Fort Qu' Appelle	"	1948	100	2,386.00
Pasqua	84	Moose Jaw	"	1948	40	3,777.00
Stephens	85	Abernethy	"	1948	12	8,716.00
Wolseley	86	Wolseley	"	1948	20	1,800.00
Young	87	Young	"	1948	250	8,892.00
Caron	88	Caron	Storage	1948	100	17,109.00
Thunder Creek	89	Kettlehut	Flood Irrigation	1948	---	27,204.00
Souris River	90	Weyburn	Flood Control	1948	---	11,998.00
Admiral Storage Dam	91	Admiral	Irr. & Stockwatering	1949	2,200	38,520.00
Bateman	92	Gravelbourg	"	1949	400	4,739.00
Sumnercove	93	Mankota	"	1949	1,500	23,837.00
Woodrow-Pinto Creek	94	Scotsguard	"	1949	1,200	23,837.00
Woodrow-Pinto Creek	95	Woodrow	Irrigation	1949	3,000	1,962.00
Arena	96	Arena	Irr. & Stockwatering	1949	1,000	41,982.00
Dummer	97	Milestone	"	1949	1,600	5,218.00
Eagle Lake	98	Coleville	"	1949	200	4,742.00
Frenchman Flats	99	Dundurn	"	1949	3,000	1,920.00
Langenburg	100	Langenburg	Irrigation	1949	2,800	9,996.00
Lonesome Lake	101	Vidra	Irr. & Stockwatering	1949	800	11,752.00
Muenster	102	Muenster	Irrigation	1949	900	2,771.00
McIntosh Slough	103	Golden Prairie	"	1949	25	2,754.00
Richman Irrigation	104	Glen Bain	"	1949	500	1,990.00
Reciprocity	105	Glen Ewen	Irr. & Stockwatering	1949	1,750	27,410.00
Summit Creek	106	Bridgeford	"	1949	800	13,227.00
Saunders	107	Rush Lake	Storage - Irrigation	1949	300	29,115.00
Shaeen	108	Rush Lake	"	1949	---	9,028.00
Valley Park Irrigation	109	Valley Lake	Irrigation	1949	1,200	8,133.00
West Osage	110	Cedoux	Irr. & Stockwatering	1949	300	4,905.00
Beadle	111	Beadle	Stockwatering	1949	2	997.00
Brock Community	112	Brock	"	1949	2	951.00
Caron Community Dam	113	Caron	"	1949	4	697.00
Cactus Lake	114	Cactus Lake	"	1949	2	730.00
Chapleau Lake	115	Montmartre	"	1949	3,530	8,208.00
Dry Lake	116	Forward	"	1949	600	9,729.00
Eastview	117	Pense	"	1949	200	5,970.00
Edenwold	118	Balgonie	"	1949	400	15,599.00
Elfros	119	Elfros	"	1949	25	7,321.00
Eatonia	120	Eatonia	"	1949	12	1,199.00
Hodgeville	121	Hodgeville	"	1949	5	2,748.00
Kindersley	122	Kindersley	"	1949	300	2,007.00
Kincaid	123	Kincaid	"	1949	10	2,539.00
Maxim Lake	124	Maxim	"	1949	5,000	20,472.00
Meeting Lake	125	Redfield	"	1949	100	2,683.00
Monet	126	Hughton	"	1949	2	875.00
Mossbank	127	Mossbank	"	1949	2	875.00
Mennon	128	Walkheim	"	1949	2	976.00

No.	Name of Project	Ref.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acres Feet	Costs
129	Prairie Lake		Superb	Stockwatering	1949	---	2	987.00
130	Snake Lake		Eston	"	1949	---	---	3,415.00
131	Sioux Reserve		Fort Qu'Appelle	"	1949	---	75	8,605.00
132	Trux Dam		Trux	"	1949	---	250	11,899.00
133	Camberly		Camberly	Irr. & Stockwatering	1950	200	100	2,106.00
134	Poplar River		Coronach	" " "	1950	300	900	14,838.00
135	Baldon & Tilney		Baldon	Stockwatering	1950	---	4	780.00
136	Cutknife		Cutknife	"	1950	---	5	280.00
137	Crane Valley		Viceroy	"	1950	---	2	599.00
138	Delisle		Delisle	"	1950	---	45	4,899.00
139	East Borden		Borden	"	1950	---	60	526.00
140	Elrose		Elrose	"	1950	---	5	999.00
141	Fleming		Moosomin	"	1950	---	75	3,282.00
142	Fighting		Maymont	"	1950	---	50	918.00
143	Hague Dugout		Hague	"	1950	---	2	1,000.00
144	Steward Valley Dugout		Steward Valley	"	1950	---	3	799.00
145	Sturgis Community Dam		Sturgis	"	1950	---	60	20,961.00
146	Viceroy		Viceroy	"	1950	---	3	798.00
147	Readlyn		Readlyn	"	1950	---	3	800.00
148	Round Hill Water Users		North Battleford	Irr. & Stockwatering	1950	425	50	4,791.00
149	Melavel		Melavel	Stockwatering	1950	---	18	1,200.00
150	Mankota Dam		Mankota	"	1950	---	10	950.00
151	McDonald Creek		McCorr	Irr. & Stockwatering	1950	400	90	4,992.00
152	Tribune Dam		Tribune	Stockwatering	1950	---	300	6,499.00
153	Bright Water Creek		Hanley	Irrigation	1950	2,500	3,500	858.00
154	Consul-Vidora		Vidora	"	1950	3,000	---	62,500.00
155	Alticane		Richard	Stockwatering	1951	---	2.5	858.00
156	Beaver Creek		Hanley	"	1951	---	200	7,998.00
157	Clearfield		Goodwater	Irr. & Stockwatering	1951	70	300	5,999.00
158	Dalmeny		Dalmeny	Stockwatering	1951	---	3	1,000.00
159	Denzil		Macklin	"	1951	---	2	975.00
160	Dunning		Radville	Irrigation	1951	120	200	3,566.00
161	Reford		Wilkie	Stockwatering	1951	---	160	1,814.00
162	Reward		Reward	"	1951	---	---	921.00
163	Russell Creek		Pambrun	Irrigation	1951	1,000	2,000	66,493.00
164	Salvador		Reward	Stockwatering	1951	---	5	1,000.00
165	Smiley		Smiley	Irr. & Stockwatering	1951	600	300	9,998.00
166	Thunder Creek Channel		Moose Jaw	" " "	1951	300	7,000	10,007.00
167	Wheatlands, R.M. of		Parkbeg	" " "	1951	100	60	3,452.00
168	Wood Mountain		Willowbunch	" " "	1951	40	60	6,337.00
169	Braddock Dam		Braddock	Irrigation	1952	2,000	1,600	83,999.00
170	Newburn Lake		Invermay	Irr. & Stockwatering	1952	50	1,280	6,477.00
171	Terrill, R.M. of		Spring Valley	Stockwatering	1952	---	10	2,491.00
172	Gouverneur Dam		Ponteix	Irrigation	1952	6,000	10,000	239,982.00
98	Eagle Lake		Coleville	Irr. & Stockwatering	1952	2,000	3,000	4,078.00

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
173	Gibson Flats	Pennant	Irrigation	1953	1, 200	---	14, 177.00
174	Artland Grazing	Marsden	Dugout (Stockwatering)	1953	---	1.5	933.00
175	Balkarres Storage	Balkarres	Dam (Storage)	1953	---	20	10, 294.00
176	East Manitou	Neilburg	Dugout (Stockwatering)	1953	---	1.5	789.00
177	Gordon Grazing	Chauvin	"	1953	---	1.5	830.00
178	Little Manitou	Seniac	"	1953	---	1.5	810.00
179	Lancer Water Users	Lancer	Irrigation	1953	1, 265	---	35, 000.00
180	Laird, R.M. of	Waldheim	Dugout (Stockwatering)	1953	---	1.5	999.00
181	Meota, R.M. of	Meota	Dugout (Stockwatering)	1953	---	1.5	1, 000.00
182	Manitou Cattle Co-op	Chauvin	"	1953	---	1.5	861.00
183	North Battleford, City of	North Battleford	"	1953	---	1.5	970.00
184	Rosemount Co-op	Landis	"	1953	---	1.5	903.00
185	Vera Grazing	Vera	"	1953	---	1.5	779.00
186	Glasnevin	Glasnevin	"	1953	---	1.5	554.00
	Ceylon Reservoir	Ceylon	Irr. & Stockwatering	Incomplete	300	250	6, 396.00
	Doonside Dam	Wawota	Irrigation	Incomplete	1, 500	1, 500	1, 307.00
	Elfos	Foam Lake	Stockwatering	Incomplete	---	900	1, 990.00
	Macklin Storage	Macklin	"	Incomplete	---	40	967.00
	North Herbert Extension	Herbert	Irrigation	Incomplete	---	---	511, 909.00
	West Poplar #1	Kildner	"	Incomplete	750	1, 000	4, 460.00
	Montague Lake	Assiniboia	"	Incomplete	235	---	1, 000.00
	Pheasant Creek	Lemberg	Storage	Incomplete	---	500	27, 000.00
	Kaposvar Creek	Melville	Stockwatering	Incomplete	---	1, 400	74, 675.00
ALBERTA							
*1	Canada Land and Irrigation Project	Medicine Hat	Irrigation	1936	45, 000	---	80, 000.00
2	Mountain View	Mountain View	Storage	1936	---	4, 200	3, 000.00
3	Wildhorse Storage	Cressday	Irrigation	1936	3, 600	4, 500	24, 370.00
*4	Eastern Irr. District	Brooks	Irrigation	1937	2, 280	22, 000	22, 490.00
*5	Rolling Hills	Rolling Hills	Irrigation	1938	25, 000	---	46, 839.00
*6	Magrath	Magrath	Irrigation	1939	4, 955	---	2, 756.00
*7	Leavitt Irrigation	Mountain	"	1939	7, 000	7, 050	65, 578.00
8	Atlee Gas Well #1	Atlee	" (pump)	1939	7, 000	---	12, 423.00
8A	Atlee Gas Well #2	Atlee	"	1939	---	---	14, 300.00
9	Bull Pound Creek	Hanna	Stockwatering	1939	---	2, 000	---
10	Bullshead Creek	Medicine Hat	Irr. & Stockwatering	1940	800	1, 130	8, 170.00
*11	Raymond	Raymond	Irrigation	1943	3, 000	1, 600	6, 000.00
12	Bartman Dam	Cessford	Irr. & Stockwatering	1943	1, 000	3, 000	49, 100.00
13	Graham Creek	Galgary	Stockwatering	1943	---	230	8, 529.00
14	Seven Persons	Seven Persons	"	1943	---	800	12, 103.00

\* - P.F.R.A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
15	Aetna Irr. District	Aetna	Irrigation	1947	8,000	---	82,004.00
16	Pothole Coulee	Magrath	Irrigation	1948	(Part of St. Mary Project)		
17	Berry Creek	Carolside	"	1948	10,000	30,000	158,884.00
18	North Fincastle	Taber	Irr. & Stockwatering	1948	2,000	4,000	17,943.00
19	South Macleod	Macleod	Irrigation	1948	6,000	---	82,614.00
20	Badger Lake	Lomond	Stockwatering	1948	---	10	2,990.00
21	Clear Lake	High River	"	1948	---	10,000	35,000.00
22	Franklin Coulee	Retlaw	"	1948	---	1,500	20,125.00
23	Hanna	Hanna	"	1948	---	500	29,498.00
24	Three Hills	Three Hills	"	1948	---	120	19,652.00
25	Vauxhall	Vauxhall	"	1948	---	30	5,883.00
26	Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
27	Brunswick Coulee	Enchant	"	1949	500	205	4,631.00
28	Dead Fish Creek	Cessford	"	1949	4,000	5,000	47,832.00
29	Eureka Irrigation Project	Grassy Lake	"	1949	12,000	1,000	38,568.00
30	East Berry Creek	Rose Lynn	"	1949	1,500	750	9,677.00
31	Sounding Creek	Cereal	"	1949	8,000	5,600	51,988.00
32	Squaw Coulee	High River	"	1949	2,000	455	17,999.00
33	Serviceberry Creek	Near Drumheller	"	1949	1,200	500	17,518.00
34	Argyle, M.D. of	Stavelly	Stockwatering	1949	---	80	10,912.00
35	C.Y. Water Users	Taber	"	1949	---	310	16,477.00
36	Snake Creek	Calgary	Irr. & Stockwatering	1950	500	300	15,976.00
37	Severn Creek	Rosebud	"	1950	1,000	1,000	24,990.00
38	Bare Creek	Comrey	"	1950	---	500	11,600.00
39	Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00
40	Wheatacre Dam	Rockyford	"	1950	1,600	1,500	12,976.00
41	Wintaring Hills	Hussar	"	1950	1,000	500	9,993.00
42	Beaverdam Creek Reservoir	Castor	Stockwatering	1950	---	300	17,996.00
43	Ross Lake Comm.	Raymond	"	1950	---	300	7,987.00
44	Lake Beauvais	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
45	Loyalist Creek	Hanna	"	1950	2,000	1,400	14,993.00
46	Irvine	Irvine	Irr. & Stockwatering	1950	70	100	4,799.00
47	Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
48	McAlpine Reservoir	Walsh	"	1951	600	1,000	15,917.00
49	McGregor Dam	Vulcan	"	1951	1,500	700	9,473.00
50	Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00
51	Pershing Dam	Glenwood	"	1951	100	200	4,782.00
52	Vulcan Dam	Vulcan	"	1951	400	150	3,997.00
53	Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
54	Wheatacre #2	Rockyford	"	1952	---	---	4,744.00
55	Esther Flood Irrigation	Macklin	"	1952	4,000	5,000	4,592.00
56	MacKay Dam	Walsh	"	1952	600	300	9,600.00
57	Meadow Creek Dam	Clareholm	"	1952	1,500	---	5,630.00
58	Cowley Community	Cowley	"	1952	750	---	4,666.00



<u>Name of Project</u>	<u>No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Acadia Valley	59	Acadia Valley	Dugout (Stockwatering)	1953	---	1.5	2,252.00
Anatole	60	Hanna	Stockwatering	1953	---	7	2,990.00
Bowmantown	61	Bowmantown	"	1953	---	500	14,203.00
Comrey Grazing	62	Comrey	Dugout (Stockwatering)	1953	---	1.5	1,000.00
Drowning Ford	63	Vale	Stockwatering dam	1953	---	100	4,368.00
Indian Farm Creek	64	Pincher Creek	and two dugouts	1953	600	500	4,795.00
Lundbreck	65	Pincher Creek	Irr. & Stockwatering	1953	---	100	4,689.00
Lewis	66	Vulcan	Stockwatering	1953	350	---	4,345.00
Nobleford Water Users	67	Nobleford	Irr. & Stockwatering	1953	---	3	11,173.00
Sheerness Grazing (Blois)	68	Roselynn	Two dugouts	1953	---	12	3,797.00
Twin River Grazing	69	Twin River	(Stockwatering) & canal	1953	---	125	4,486.00
Walsh Flats	70	Walsh	"	1953	2,100	25,000	4,700.00
Yeast Reservoir	71	Thelma	Irrigation	1953	400	800	3,200.00
Rough Meadow Reservoir		Coronation	Irrigation	Incomplete	3,200	---	2,471.00

## MAJOR PROJECTS - IRRIGATION RECLAMATION

(Projects by Special Votes of Parliament, Administered by P. F. R. A.)

To March 31, 1954

<u>Name of Project</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
		<u>MANITOBA</u>				
Assiniboine River Dyking & Cut-off Riding Mountain	Brandon	River Control	Incomplete	---	---	151, 786
Saskatchewan River Reclamation - Pasquia Area	Dauphin	Drainage	Incomplete	---	---	598, 294
	The Pas	Reclamation	Incomplete	135, 000	---	517, 754
		<u>ALBERTA</u>				
Bow River (a) Purchase of Canada Land & Irrigation Company	Medicine Hat	Irrigation	Incomplete	235, 000	408, 862	54, 398
(b) Development & Construction						2, 353, 182
St. Mary	Lethbridge	Irrigation	Incomplete	519, 000	320, 000	12, 687, 311
Belly River Diversion	Lethbridge	Irrigation	1950	---	---	8, 665, 311
						53, 901
		<u>BRITISH COLUMBIA</u>				
Cawston Benches	Keremeos	Irrigation (Pump)	1951	629	2, 000	185, 491
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	---	120, 366
Western Canada Ranching #2	Kamloops	Irrigation (Pump)	1950	54	---	9, 737
Lillooet - Pemberton	Pemberton	River Control	1953	---	---	1, 056, 539
South Thompson - Niskoniith Gravity Project	Kamloops	Irrigation	Incomplete	1, 030	1, 200	12, 282
Westbank Project	Kelowna	Irrigation	1950	1, 200	2, 500	537, 450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	---	32, 229
Penticton West Bench	Penticton	Irrigation (Pump)	1953	800	---	66, 362

(Above includes only Construction Costs)

APPENDIX VII

PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

	April 1, 1935 - March 31, 1954	
	1935 - 1953	1953 - 1954
<u>ADMINISTRATION</u>		
Ottawa Administration	202, 900	21, 687
Regina Administration	889, 804	87, 404
Total	<u>1, 092, 704</u>	<u>109, 091</u>
		Total
		224, 587
		<u>977, 208</u>
		1, 201, 795
<u>EQUIPMENT</u>		
Purchase of Equipment	533, 115	176, 407
Upkeep of Equipment	398, 167	103, 307
Equipment Depot	891, 067	205, 126
Total	<u>1, 822, 349</u>	<u>484, 840</u>
		709, 522
		501, 474
		<u>1, 096, 193</u>
		2, 307, 189
<u>LAND UTILIZATION</u>		
Supervision	466, 582	41, 059
Construction of Community Pastures	4, 945, 711	324, 864
Pasture Improvements	52, 461	13, 650
Operation of Community Pastures	2, 317, 181	490, 370
Purchase of Bulls	378, 429	60, 315
Re-establishment of Farmers	---	---
Grass Seeding & Experimental Regrassing	485, 839	71, 825
Total	<u>8, 646, 203</u>	<u>1, 002, 083</u>
		507, 641
		5, 270, 575
		66, 111
		2, 807, 551
		438, 744
		---
		<u>557, 664</u>
		9, 648, 286
<u>WATER DEVELOPMENT</u>		
Supervision	688, 555	24, 203
Small Projects including Engineering	11, 801, 510	1, 118, 758
Large Irrigation and Storage Projects		
Supervision	1, 554, 478	59, 737
Construction and Improvements	5, 785, 126	584, 570
Maintenance and Operation	4, 170, 810	476, 409
Re-establishment of Farmers	184, 699	6, 449
Survey and Explorations	1, 600, 484	---
Purchase of Land	683, 410	14, 326
Total	<u>26, 529, 072</u>	<u>2, 284, 452</u>
		712, 758
		12, 920, 268
		1, 614, 215
		6, 369, 696
		4, 647, 219
		191, 148
		1, 600, 484
		<u>697, 736</u>
		28, 813, 524
<u>Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service.)</u>		
	4, 966, 394	---
	<u>43, 056, 722</u>	<u>3, 880, 466</u>
GRAND TOTAL		4, 966, 394
		<u>46, 937, 188</u>

SPECIAL VOTES UNDER P. F. R. A. ADMINISTRATION

	1953 - 1954	Total
Asiniboine River, Surveys and Construction	118,401	218,390
Lillooet Project B.C. Construction & Explorations	1,163,811	1,164,433
Land Reclamation & Development in B. C.	(j) 1,574,715	1,696,029
St. Mary's Irrigation Project - Alberta	(i) 11,882,999	13,349,244
Bow River Project - Alberta	11,631,518	16,622,659
Red Deer River Project - Alberta	(g) 706,825	744,301
Other Miscellaneous Projects - Construction	210,392	210,392
Land Protection & Reclamation - Manitoba	575,760	1,116,556
South Saskatchewan River Project - Saskatchewan	(g) 2,687,931	3,127,024
Buffalo Pound Project - Saskatchewan	35,934	59,584
Surveys and Engineering Costs	(1) 3,154,010	4,256,816
GRAND TOTAL	33,742,296	42,605,438

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147,530.22 expended on St. Mary Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.
- (h) General Survey charges now being paid from other P.F.R.A. Votes.
- (i) Amounts shown in notes (d), (e) and (f) to be added to this total.
- (j) Veterans' Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P.F.R.A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).



EXPENDITURES BY PROVINCES

PRAIRIE FARM REHABILITATION ACT AND SPECIAL VOTES UNDER ITS ADMINISTRATION

	<u>April 1, 1935 - March 31, 1954</u>			
	<u>Man.</u>	<u>Sask.</u>	<u>Alta.</u>	<u>B. C.</u>
P. F. R. A.				
Major Irrigation and Reclamation in the Prairie Provinces	3,902,774	34,066,410	5,563,873	
Land Reclamation, Construction and Development in B. C.	24,951	3,282,310	30,820,311	2,860,016
Land Protection and Reclamation	1,116,556			
Dyking and Cut-off (Assiniboine, Manitoba)	218,390			
Surveys and Engineering Costs	396,872	2,017,211	1,739,380	129,443
Administration	209,264	1,616,897	1,450,295	127,673
	<u>5,868,807</u>	<u>40,982,828</u>	<u>39,573,859</u>	<u>3,117,132</u>
				<u>89,542,626</u>

REVENUE

REVENUE RECEIVED FROM PROJECTS UNDER P. F. R. A. OFFICE

	<u>To March 31, 1954</u>
Pasture Operation and General Revenue	3,005,101
Irrigation Project Operation (under P. F. R. A. Vote)	408,278
Irrigation & General Revenue (Major Projects Vote)	844,862
Total	<u>4,308,241</u>

## SUMMARY OF STATISTICS RELATING TO MAJOR P.F.R.A. PROJECTS

As at March 31, 1954

## Community Pastures.

Pasture Units	62
Total fenced pasture area	1,678,736 acres
Area regressed since 1939	180,293 acres

## Water Development

Total Small Water Projects	50,005
Total Community, Irrigation and Storage Projects	290

## Bow River Irrigation Project

Irrigable Area	240,000 acres
Travers Dam	
Length	3,000 feet
Base width	1,000 feet
Maximum Height	165 feet
Volume of Embankment	4,500,000 cubic yards
Spillway Capacity	7,700 c.f.s.

## Travers Reservoir

Total Storage	265,000 acre feet
Useable Storage	100,000 acre feet
Length	12 miles
Area	5,700 acres

# St. Mary Irrigation Project

Irrigable area	500,000 acres
St. Mary Dam	
Length	2,536 feet
Base Width	1,480 feet
Maximum Height	195 feet
Volume of Embankment	4,500,000 cubic yards
Spillway Capacity	53,000 c.f.s.

## St. Mary Reservoir

Total Storage	320,000 acre feet
Useable Storage	290,000 acre feet
Length	17 miles
Area	11,600 acres

# Proposed South Saskatchewan Project

over 500,000 acres

## Irrigable Area

## South Saskatchewan Dam

Length	16,700 feet
Height	205 feet
Volume of Embankment	40,000,000 cubic yards
Spillway Capacity	265,000 c.f.s.

## South Saskatchewan Reservoir

Total Storage	8,400,000 acre feet
Useable Storage	3,100,000 acre feet
Length	135 miles
Area	116,000 acres
Area	135,000 acres

## Pasquia Area





EDMOND CLOUTIER, C.M.G., O.A., D.S.P.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1984

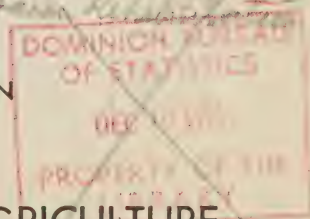
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*Source: Agriculture Department of Prairie Farm Rehabilitation Branch*

# REPORT

ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1954 - 55



CANADA DEPARTMENT OF AGRICULTURE  
PRAIRIE FARM REHABILITATION BRANCH  
REGINA, SASKATCHEWAN

## COVER PHOTOGRAPH

The cover of this Report depicts the Duncairn Dam, a multiple purpose storage structure, on Swift Current Creek in southwestern Saskatchewan.

This storage is utilized, in part, to irrigate over 20,000 acres of land between Swift Current and Reed Lake. In the immediate vicinity of the reservoir itself there are considerable areas of land capable of irrigation by pumping.

In addition to supplying water for irrigation, with all its attendant benefits, this reservoir keeps over 35 miles of stream supplied with water at all times for livestock needs.

The City of Swift Current, with its population of 10,000, is assured of a dependable water supply from the reservoir. There is now no fear of a return of the water shortage which prevailed in the 1930s. In addition, processing and packing industries, a new power plant, an oil refinery and the railway, all draw heavily upon this water. Constant and adequate stream flow below the city also guarantees efficient sewage disposal.

The stability and progress of the Prairie West leans heavily upon the availability of water. Through Duncairn Dam and over 300 similar structures, the Water Development Branch of P.F.R.A. is seeking to provide that solid foundation for all prairie people.

(71)  
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Prairie Farm Rehabilitation  
and Related Activities  
1954 - 55





# P.F.R. PROJECTS IN WESTERN CANADA

- LEGEND**
- Irrigation Projects Completed
  - Large Reservoirs Completed
  - Large Reservoirs Proposed
  - Large Irrigation Projects Proposed / Incomplete
  - Reclamation Projects
  - Community Projects
  - P.F.R. Boundary

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## INTRODUCTION

The **Prairie Farm Rehabilitation Act**, as originally passed in 1935, provided for the spending of four and three-quarter million dollars over a five-year period in measures to provide for the rehabilitation of drought and soil drifting areas in the **Prairie Provinces**. An amendment in 1937 extended the scope of the program by making specific provision for the withdrawal of poor quality lands from cultivation and the resettlement of the farmers operating such lands. By a further amendment in 1939 the five-year limitation was removed and the Act was continued in force indefinitely.

Many policies and projects have been carried out under the Act in the twenty years since it came into force. They vary widely in their nature and in their scope but each one has had as its objective the better utilization of land to minimize problems of drought or the conservation of water for farm purposes. This Report endeavours to describe the various types of undertaking included in the **P.F.R.A.** program and to report the results achieved to date.

The organization developed within the Department of Agriculture to administer the **Prairie Farm Rehabilitation Act** has also been made responsible for the construction of other irrigation, land reclamation and land development works which, because of size or location, are not included in the actual **P.F.R.A.** appropriation. They are provided for by special votes of Parliament. These too are covered by the present Report.

While the Report is primarily concerned with the work done in the year 1954-55 it also deals in a general way with the **P.F.R.A.** and Special Project programs as a whole. Special consideration is being given to the Water Development Branch in this issue.

## ORGANIZATION AND ADMINISTRATION

The P.F.R.A. has its headquarters at Regina, Saskatchewan. It is administered by a Director who is responsible to the Deputy Minister of agriculture in Ottawa.

The organization in Regina consists of the Director's Office, the Water Development Branch, the Engineering Services Branch and the Community Pasture Branch: the branch heads being responsible to the Director.

The Director's Office co-ordinates the activities of the different branches of work with the regional, district and special project offices. It also administers resettlement and rehabilitation activities, the Construction Equipment and Supply Division, the Land Division and the Planning and Information Division. In addition a Budget and Accounting Division maintains liaison with the Treasury Department.

The Engineering Services Branch is responsible for Surveys, Soil Mechanics, Drainage, Design, Hydrology, Hydraulic Studies, Air Photo Analysis and Engineering Geology, and Stream Bank Erosion Control. These services are co-ordinated to establish the feasibility of the many types of projects that the staff is required to investigate. The construction of major irrigation and reclamation projects is administered through project headquarters.

The Community Pasture Branch is an important part of land utilization. It undertakes construction of new pastures and supervises the operation of the community pasture network throughout Saskatchewan and Manitoba.

In addition to the Head Office in Regina there are Regional Offices in Winnipeg, Man., and Kamloops, B.C., plus eighteen District Offices and nine Project Offices throughout the four Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and complexity of the particular project.

Since P.F.R.A. activities are closely allied to those of certain Provincial Government Departments, every endeavour is made to co-operate with these agencies. Similarly, the Branch maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and Hydrometric Service.

Fundamentally, P.F.R.A. is organized to carry out a program of work aimed at a greater security and stability for prairie agriculture.

# SASKATCHEWAN

## COMMUNITY-PASTURES UNDER THE

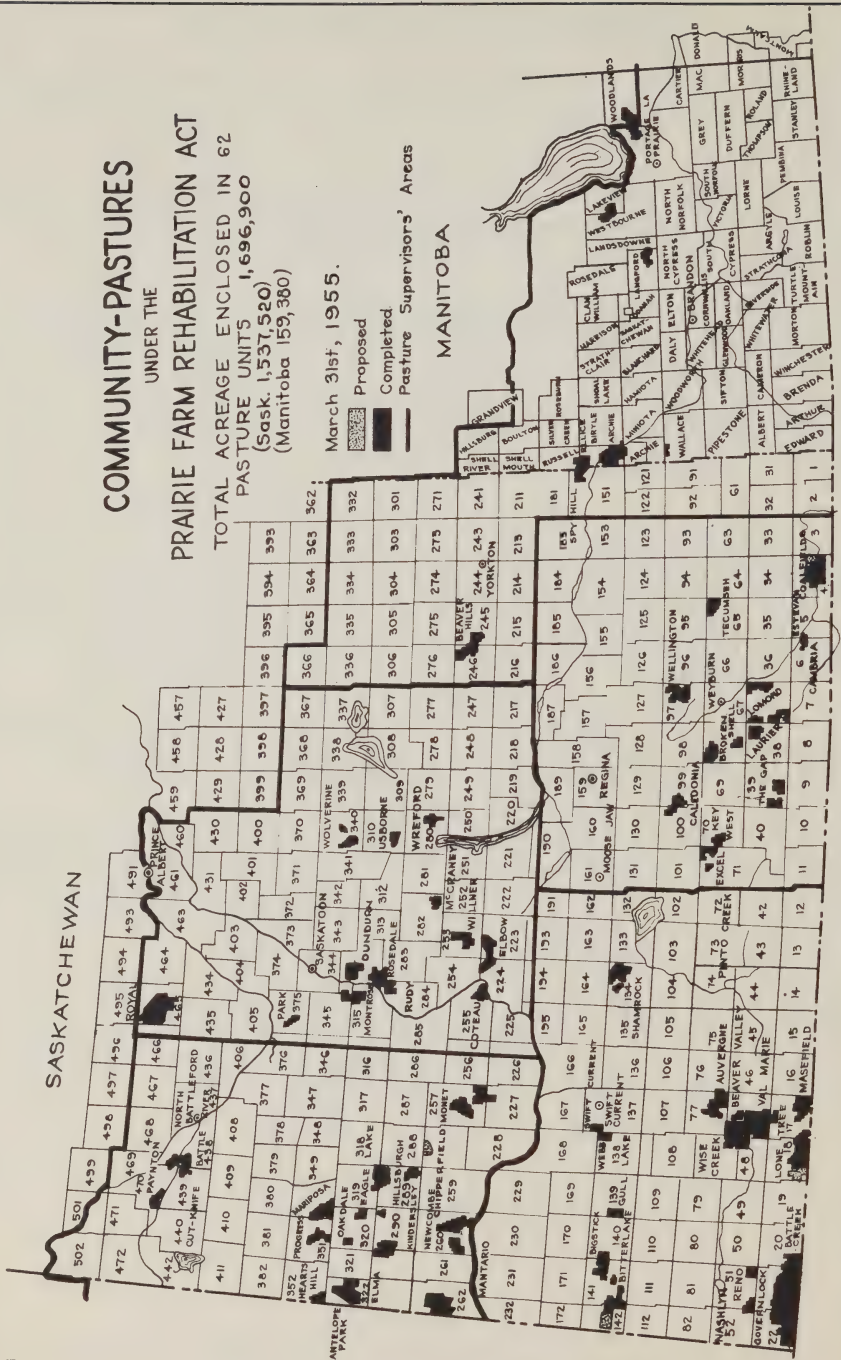
### PRAIRIE FARM REHABILITATION ACT

TOTAL ACREAGE ENCLOSED IN 62  
PASTURE UNITS 1,696,900  
(Sask. 1,537,520)  
(Manitoba 159,380)

March 31st, 1955.

- Proposed
- Completed
- Pasture Supervisors' Areas

## MANITOBA



## COMMUNITY PASTURES

The work of the Community Pasture Branch was commenced in 1937, following an amendment to the Prairie Farm Rehabilitation Act. The Branch had as its original objectives the permanent removal of submarginal areas from cultivation, the establishment on these areas of community pastures and the rehabilitation and resettlement of farmers residing in submarginal areas.

Under this program the Governments of Saskatchewan and Manitoba selected a number of areas which they considered in need of such development. After arranging control of the land the Provinces approached the Government of Canada which, in turn, agreed to finance and construct community pastures in the areas indicated.



Fig. 1. Ref. 3557

The corrals and weigh scales at the Swift Current-Webb Community Pasture, Saskatchewan. These scales are used in conjunction with grazing trials set down by the Swift Current Experimental Farm.



The community pasture program, with its emphasis on converting sub-marginal cropping land into high producing grazing land for the benefit of the whole community has been instrumental in turning a national liability into a national asset.

In 1954, there were 62 pasture units in operation representing a total of 1,696,900 acres. This is an increase of 18,164 acres over the figure for 1953. This land, during the spring and summer months carried 106,276 head of stock belonging to 5,959 patrons.

Complete details of acreage, revenue, construction costs and numbers of livestock pastured will be found in Appendices I and II of this report.

## PASTURE OPERATIONS

The 1954 season was a particularly good one from the point of view of grass growth and pasture operations generally. Stands of crested wheat grass seeded in 1953 made very favourable growth. Hay areas produced good yields of high quality fodder while pastures provided an abundance of grazing and a good carryover in addition.

## PASTURE SERVICES

Pasturage is allocated by the Pasture Advisory Committee on the basis of need in the following manner:

1. First pasture privileges will be given to any farmer who has been moved out of the pasture area by the Administration and relocated within the municipality where the pasture is situated.
2. Second pasture privileges will be given to all other bona fide farmers located within the municipality or municipalities in which the pasture is situated.
3. If the pasture can carry additional livestock, the pasture privileges may be extended into adjoining municipalities on the basis of need up to the carrying capacity of the pasture.
4. In order that the pasture privileges may be extended to as many residents as possible, the Advisory Committee shall set a maximum number of livestock to be accepted from any one person. This maximum may be varied according to local conditions.
5. All applications for pasture privileges must be received not later than March 15 of each year and shall be passed upon at the first meeting of the Advisory Committee subsequent thereto.

The following is a schedule of P.F.R.A. pasturage fees and service charges in effect at the present time:

Grazing Rates

Cattle per month	0.75
Horses per month	1.00
Sheep per month	0.10 (provide own herder)
Cows (breeding service)	3.00
Colts born in pasture, flat rate	3.00 up to and including November 30 of current year
Calves born in pasture, flat rate	2.00 up to and including November 30 of current year

A minimum grazing charge equivalent to three months' fees will be levied against any animal recorded for pasturage.

Rates for Vaccine and Sundry Services

Blackleg, Hemorrhagic and Mixed Vaccine	0.15 per single dose
Dehorning	0.50 per head
Warble and Horn Fly spraying (treatment at corral)	0.15 per head
Mineral Supplement	0.35 per head
Castration:	
Cattle under six months	1.00 per head
Cattle six months and over	2.00 per head
Encephalomyelitis and Special Vaccines	At cost

Where extra hay or wood in community pastures is available, the following rates will apply, subject to the approval of the pasture manager and confirmation from head office.



Fig. 2. Ref. 3561

The new pasture headquarters buildings on the Newcombe Community Pasture, near Glidden, Saskatchewan.

All hay must be put up on share basis, such to be governed by quality and quantity available.

Dry Wood	0.50 per cord
Green Wood	1.00 per cord

#### HAYING

During 1954 a total of approximately 3,500 tons of hay were cut and stacked. This was made up of crested wheat grass, mixed grasses and wild hay. The total refers to all hay produced, as distinct from that portion allotted to each pasture under the share agreement.

## REGRASSING

During the 1954 season 10,255 acres were regrassed on 21 community pastures. This total was made up of 865 acres of mixed grasses for hay, 4,500 acres of crested wheat grass and 4,890 acres of crested wheat grass and brome grass. On the Dundurn Department of National Defence area 4,139 acres were seeded to crested wheat grass. This figure is included in the overall total.

An estimated 190,548 acres have now been reseeded within community pastures. This figure does not include those considerable areas regrassed by P.F.R.A. and subsequently incorporated into community pastures prior to 1939.

The regrassing policy, coupled with the program of water development and controlled grazing has more than tripled the original carrying capacity of the pastures.

## BREEDING SERVICE

The bulls used in the breeding service in operation on P.F.R.A. Community Pastures are provided by the Government of Canada, on a rental basis, to the Grazing Associations. The amount of the annual rental is based on the average cost, the average length of service and the average amount realized at time of disposal. A total of 870 purebred, beef-breed bulls were used in this service in 1954. This total is made up of 770 Herefords, 95 Shorthorns and 5 Aberdeen Angus; the specific breeds being decided by the Grazing Associations. The maximum number of cows that any one patron may breed under this service is 35 per cent of the total number of cattle he has in the pasture or ten head, whichever is the greater number. Bulls are not provided to service over 35 head of cows for any one patron. The bull service charge of \$3.00 per head is set by the Administration and revenue accruing from this source is credited to pasture earnings.

A total of 20,521 cows were handled by this service and the calf crop was ninety per cent.

## PASTURE CONSTRUCTION

During 1954, 184 miles of fencing was constructed on the community pastures. This makes a grand total of 4,267 miles of fencing on all community pastures since the inception of the program. Sixteen new corrals were built along with 14 Texas gates and 85 swing gates. Eight new dams were constructed as well as 11 dugouts, 17 wells and 13 windmills. A number of dwellings, garages, granaries and barns were also erected.





Fig. 3. Ref. 3764

Fencing on the Woodlea Community Pasture for the Government of Manitoba presented problems for P.F.R.A. work crews.

In the Province of Manitoba a start was made on the construction of the Woodlea Pasture. This work was undertaken for, and financed by, the Government of Manitoba. Fencing the 15,800 acre portion of this project proved a difficult undertaking due to wet conditions and the frequent occurrence of hard pan, stones and bed-rock.

A new policy in regard to community pasture improvement was initiated in 1954. This policy is directed towards the clearing and seeding down to grass of currently wooded lands. On the Langford Pasture in Manitoba approximately 100 acres were treated in this manner and on the Beaver Hills Pasture 500 acres were cleared early this spring.

By special agreement with the Department of National Defence, a 24,640-acre area at Dundurn, Saskatchewan, was fenced for use as a community pasture. Under the agreement the tenure of this area may be terminated on short notice by the Department of National Defence and livestock are admitted on this understanding. At this time stockwatering facilities have been provided and a corral will be built early in the new fiscal year.



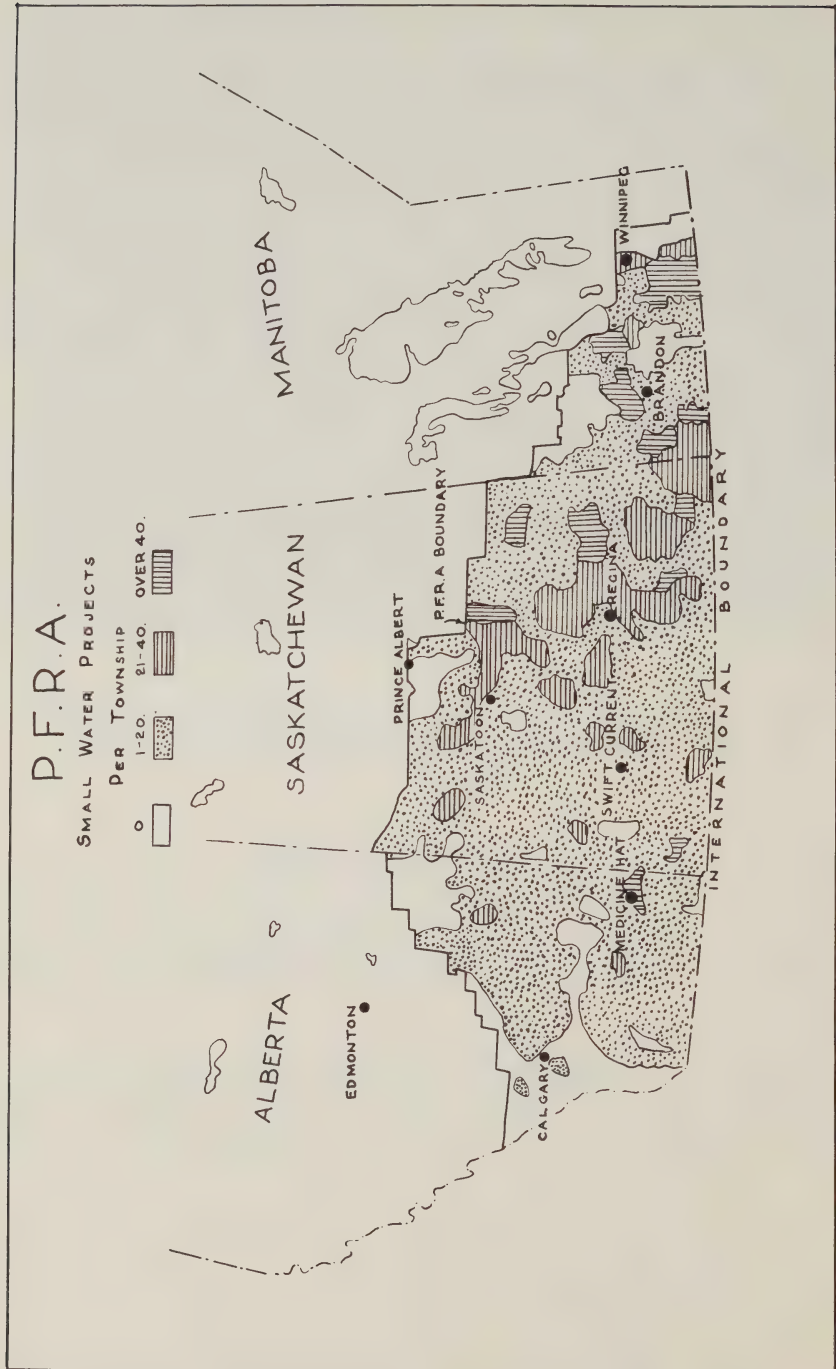
Fig. 4. Ref. 3783

Clearing and windrowing trees on the Beaver Hills Community Pasture, Saskatchewan. The cleared areas will be seeded to pasture in 1955.

#### LIVESTOCK LOSSES AND INSURANCE

During 1954, 32 community pastures elected on their own initiative to carry livestock insurance. Twenty-six of these carried Mutual Insurance and six carried insurance with a Line Company.

Livestock lost during the year from all causes amounted to 605 cattle and 4 horses. Of this number 284 cattle and 4 horses were eligible for insurance compensation from the companies concerned. Premiums collected amounted to \$30,552.25 while compensation paid amounted to \$15,908.00.





## WATER DEVELOPMENT

The Water Development Branch of P.F.R.A. is concerned with assisting individual farmers and communities within the P.F.R.A. area to establish water storage works on a self-help basis. Water thus provided may be used for a variety of purposes such as irrigation, stockwatering, domestic use, town supply and recreation.

Work carried out by the Branch is divided into three categories comprising individual and neighbour farm projects, community projects, and irrigation and storage projects.

In the case of individual and neighbour farm projects technical and/or financial assistance is made available but the responsibility for actual construction remains with the individuals concerned. Community projects may be built and financed entirely by the Branch or in conjunction with the community, depending on the circumstances. Classified as irrigation and water storage are those projects which are too big to be handled, even in part, by local bodies and are yet too small to come under the classification of major irrigation and reclamation works. The capital works for such projects are usually financed by P.F.R.A. and the distribution works by the Provincial Governments or other local bodies.

Full details relating to all these projects will be found in Appendices III, IV and V.

### INDIVIDUAL AND NEIGHBOUR FARM PROJECTS

Individual farm projects refer to those benefiting one farm only while a neighbour project represents two or more farmers building a somewhat larger project for their common use.

These projects are primarily designed to catch and store run-off water from melting snow. The type of construction is commonly a dugout, a small dam or a diking system. The term dugout refers to a rectangular-shaped excavation usually having a storage capacity in the vicinity of one and one-half acre-feet.

During 1954-55 a total of 1,666 individual projects were completed. This figure represents 1,270 dugouts, 227 stockwatering dams and 169 small irrigation schemes. Over the same period, 20 neighbour projects were constructed. These were made up of 14 dugouts and 6 small irrigation projects. The number of individual and neighbour projects constructed in 1954 was 1,686 bringing to 51,691 the total since the inception of the program.

For the work carried out on these projects during 1954-55 P.F.R.A. reimbursed farmers to the extent of \$214,422.89. This figure represents approximately twenty-five per cent of the total outlay on these projects; the balance being assumed by the farmers themselves. The rates of assistance paid were





Fig. 5. Ref. A947

Typical of more than 6,400 stockwatering dams, constructed by prairie farmers with P.F.R.A. assistance, are these twin structures on a farm southwest of Swift Current, Saskatchewan.

four and one-half cents per cubic yard of earth moved; twenty-five cents per cubic yard for rock or field stone placed to protect earthwork, plus the actual cost of construction materials such as pipe, cement and lumber. In the case of individual projects the maximum financial assistance given was \$125 for a dugout, \$150 for a stockwatering dam and \$350 for an irrigation system. Neighbour projects carried the same unit rates but the maximum assistance payable was \$500, irrespective of the type of project.

## COMMUNITY PROJECTS

In cases where farmers form a Water Users' Association with the intention of storing and utilizing water on a community basis the P.F.R.A. will co-operate with the group. Rural Municipalities having the same objectives as the Water Users' Associations are also included under this scheme. Provided that the proposed project is feasible from all aspects the Government of Canada may assume the cost of the capital works involved. On irrigation projects this does not include the cost of the distribution system for irrigating. The Province concerned or the Water Users' Association usually undertakes this work.

Typical of the community projects constructed under this policy, and giving excellent service in their second and third year of operation, are those located in Alberta along the northern slope of the Cypress Hills near the Alberta-Saskatchewan boundary. The Ambrose Flats, McAlpine and MacKay Creek projects are now in full operation.

Taking advantage of natural depressions to store over 150 acre-feet of water during flood season the Ambrose Flats Project is thereby capable of releasing water down Ross Creek in drought times for the benefit of twelve water users along a twelve-mile reach towards Irvine, Alberta. Similar in type but somewhat larger in scale, the 650-acre-foot McAlpine project serves fourteen farmers along the creek channel towards Walsh. The MacKay Creek project with its storage of 600 acre-feet has been of special value in meeting the water supply needs of the Graburn district. Residents of this area have, in many years, been forced to haul their water. The new project means an assured supply for some twenty farmers along 15 miles of creek course. These projects, among many others, are doing their part collectively to achieve a greater measure of rehabilitation and economic security for prairie farmers.

Typical of the 40 community projects upon which a total of \$267,301.00 was spent during 1954-55 are the Cressday, Eston and Loveland projects.

The Cressday project designed primarily to assist the livestock industry consists of a 850-acre-foot reservoir constructed at the siding of Cressday on the Weyburn-Lethbridge line of the C.P.R. Cressday is in Alberta on the south slope of the Cypress Hills adjacent to the Saskatchewan boundary. The Cressday siding is a focal point for the shipping of large numbers of cattle from an extensive area of southeastern Alberta. With the completion of the reservoir local stockmen, in co-operation with the C.P.R. and other agencies, constructed a system of sorting corrals, loading pens and a weigh scale at the siding. In addition to its important use at the siding the reservoir also serves farms for 20 miles to the Saskatchewan boundary by assuring constant flow in Lodge Creek.

The Eston project is primarily concerned with the provision of domestic water for an agricultural community. It consists of a large dugout with dikes to store about four million gallons of water which are impounded during the spring run-off season. Prior to the excavation of this dugout the community of Eston was frequently obliged to obtain its water by tank from the South Saskatchewan River, 17 miles distant.

The Loveland community project is a combination storage, irrigation and wild life conservation project situated west of Pollockville in one of the Special Areas of Alberta. Its name is significant because it is that of the homesteader who located on the site in 1907 and who abandoned his holdings because of drought in later years. The project was built in co-operation with the Special Areas Board of Alberta and Ducks Unlimited. It utilizes a series of natural depressions to store some 3,000 acre-feet of water. During times of need this water may be





Fig. 6. Ref. 3600

The first day's construction on the Loveland Community Project near Pollockville, Alberta. This is a combined storage, irrigation and wildlife conservation project.

turned down Berry Creek to serve local farmers. The surface area of the project is large and its shore line is irregular to provide maximum use for livestock and wild fowl.

#### IRRIGATION AND WATER STORAGE PROJECTS

During 1954 a total of \$427,928.00 was spent on eight irrigation and water storage projects of which five were completed.

In Manitoba two earth-fill dams were completed to form a reservoir on a coulee just west of Boissevain. The purpose of these structures is to catch and store intermittent run-off from a stream emptying into the coulee. Such storage is an insurance against drought and also serves as a water supply for the town of Boissevain. Other structures completed in Manitoba were the Lewko and Hampson dams on the LaSalle River.

In Saskatchewan work was virtually completed on the Moosomin Dam on Pipestone Creek. This earth-fill structure, constructed over a two-year period, is located immediately downstream from the junction of the Pipestone and Little

Pipestone Creeks, about six miles south of the town of Moosomin. During 1953 the spillway excavation was completed and the concrete work started, while in 1954 the spillway was finished and the main dam and outlet were constructed. The 9,000-acre-foot reservoir will provide many benefits for the surrounding community. The water will be used for stockwatering, riparian and municipal needs and in addition will provide a recreational area for southeastern Saskatchewan.

Also in Saskatchewan, the Kaposvar Creek project south of Melville was completed. This earth structure will serve local stockwatering needs and will also augment the domestic supply for the town of Melville.

In Alberta the only irrigation and water storage project undertaken in 1954 was the Bedford Slough Project. Here a low earth dike impounds 5,000 acre-feet of water for irrigating approximately 2,000 acres of land. To increase the supply to the reservoir a canal has been excavated from a nearby landlocked slough. Located approximately 30 miles east of Manyberries the Bedford Slough Project is readily capable of being enlarged to store 8,000 acre-feet by raising the present earth dike.



Fig. 7. Ref. 3663

The spillway and main earthfill of the Moosomin Dam south of Moosomin, Saskatchewan. The 9,000 acre-foot reservoir now serves stockwatering, riparian and municipal needs and in addition provides a recreational area for southeastern Saskatchewan.





Fig. 8. Ref. 3656

The west Boissevain Dam, Manitoba, completed apart from the placing of lower riprap.

## TECHNICAL ASSISTANCE

In addition to the financial assistance referred to in previous sections, the Water Development Branch also provides free engineering and agricultural services.

During 1954-55 a total of 7,965 visits were made to water development projects as follows:

### Agricultural Services

#### Dugouts

Preliminary calls	1,060
Final inspections	942
Miscellaneous inspections	625

#### Stockwatering Dams

Preliminary calls	305
Final inspections	70
Miscellaneous inspections	177

Small Irrigation Projects

Preliminary calls	271
Final inspections	69
Miscellaneous inspections	310

Community Projects

Preliminary calls	228
Final inspections	24
Miscellaneous inspections	199

Engineering Services

Small Irrigation Projects

Miscellaneous inspections	1,377
Surveys completed	243
Plans prepared	181
Final inspections	157

Stockwatering Dams

Miscellaneous inspections	654
Surveys completed	340
Plans prepared	177
Final inspections	225

Community Projects

Projects investigated	159
Projects completed	35
Survey and plans	58
Maintenance	79

## REHABILITATION AND RESETTLEMENT

Under the terms of the Prairie Farm Rehabilitation Act considerable emphasis has been placed on a policy of rehabilitation and resettlement of people from those areas of the prairies where drought conditions have rendered farming a hazardous and frequently uneconomic pursuit.

An answer to the problem has been provided in the form of irrigation projects. Small irrigation developments designed to meet local needs for forage and pasturage have enabled farmers to increase livestock holdings, retire a greater proportion of their land from grain farming and generally follow a more balanced type of land use. Large irrigation projects, on the other hand, have been able to cater to the complete resettlement of farmers from problem areas not capable of being served by local projects. Lands vacated by these people have been regrassed and incorporated into community pastures. Following is an account of those irrigation projects in Saskatchewan and Alberta which are fulfilling the purpose of resettlement and rehabilitation of prairie farmers.



Fig. 9. Ref. 3583

Irrigation operations on the Val Marie Irrigation Project, southwestern Saskatchewan.



Fig. 10. Ref. 3448

From the drought-prone area of Masfield, Saskatchewan a farmer builds a new home and makes a fresh start on the Hays area of the Bow River Project.

## SASKATCHEWAN

### VAL MARIE IRRIGATION PROJECT

This project has a total irrigable area of 5,920 acres. In 1954, 420 acres were developed for irrigation and seeded to forage while a further 230 acres were prepared for seeding in 1955. A large percentage of the irrigated land is devoted to the production of forage crops which are utilized for the winter maintenance of the district's cattle. In 1954, irrigated plots produced a great quantity of oat and wheat straw as well as hay, all of which was fed to livestock along with the harvested grain. Plot holders alone ran 5,000 cattle during the year. More emphasis is currently being placed on irrigated pasture and full use is being made of areas along canals, laterals and field ditches for fall and winter grazing. Most of the irrigation farmers on the project also graze cattle in the nearby Val Marie Reserve Community Pasture. The irrigation project and the pasture present a productive working combination.

The Val Marie project has proved instrumental in stabilizing the economy of the farmers over a wide area but continuing emphasis is being placed on the need for establishing reserve feed supplies to meet any possible return of drought.



## WEST VAL MARIE IRRIGATION PROJECT

Somewhat smaller than Val Marie this 4,230-acre project promises to be every bit as important. During 1954, a further 730 acres were developed for irrigation and seeded to forage with another 550 acres being prepared for seeding in 1955. A total of 1,660 tons of hay was produced by the 30 plot owners in this area. A considerable quantity of hay was sold to buyers within a forty-mile radius of the project indicating the increased cattle population of the area. A total of 350 head of cattle have grazed on the West Val Marie project since mid-December taking advantage of this excellent wintering site.

## EASTEND IRRIGATION PROJECT

On this project again there is continued and growing emphasis on the raising of livestock and production of forage crops. The 45 plot holders in the area now own 2,600 cattle and 2,300 sheep and during 1954 produced 1,700 tons of hay. This production was lower than expected as excessive rainfall prevented many operators from harvesting a second cut of hay. Hail took a toll of grain crops and a number of these along with the second hay crop were utilized for grazing. During the season P.F.R.A. assisted farmers to level 250 acres of land at cost, thus facilitating a more efficient use of irrigation water. On the Frenchman River at Eastend a pile revetment was constructed to prevent bank erosion. Similar work was carried out elsewhere along the same stream.

## CONSUL IRRIGATION PROJECT

This project, located in the Battle Creek Basin in the area around Consul and Vidora, has a total of 3,000 acres of developed land which are being irrigated with the border-dike and border-ditch systems. An additional 200 acres of natural meadows at Nashlyn are spring flooded from the Nashlyn Canal. Two thousand tons of hay were produced off 1,260 acres in 1954. This production was lower than normal due to the wet season. In addition to 16,000 bushels of oats and 7,000 bushels of barley the project also grew 22,000 pounds of alfalfa seed and 3,000 pounds of slender wheat grass seed. The 35 plot holders on the project own 2,000 cattle and 500 sheep. In addition to providing forage for these livestock the area also contributes grazing facilities for farmers in the surrounding district.

## MAPLE CREEK IRRIGATION PROJECT

This project covering close to 10,000 acres is made up of the Maple Creek Flats, close to the town of Maple Creek, and the Upper and Lower "V" areas to the north. At the present time another 500 acres of the Maple Creek Flats area is being developed for irrigation. Should the proposed Harris Reservoir be constructed a further 500 acres could be developed on the Maple Creek Flats. Livestock currently owned by the 118 plot holders amounts to 8,000 cattle and 2,000 sheep. The feed produced on the project is utilized by

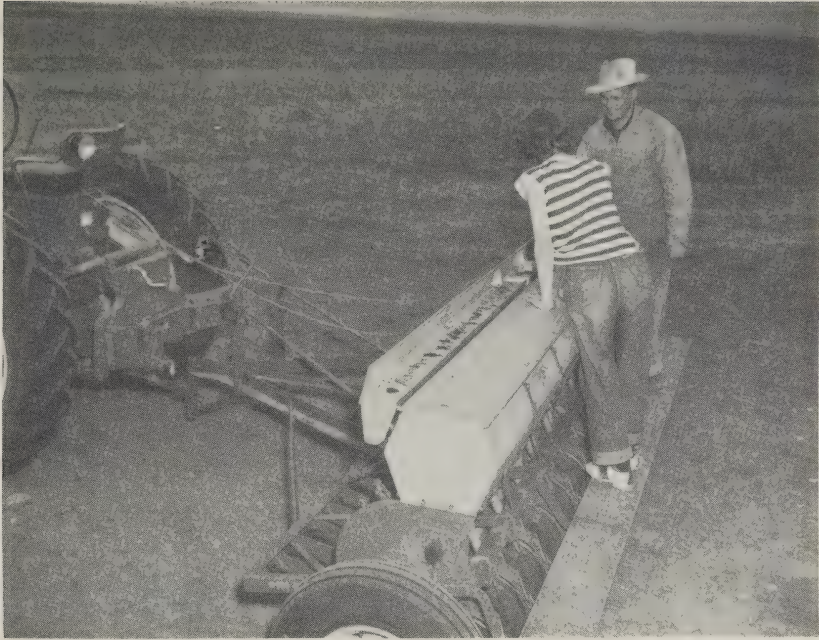


Fig. 11. Ref. 3449

A new settler and his wife prepare to seed alfalfa on the Hays area of the Bow River Project.

these livestock and as well by other livestock in the district. In addition to its importance as a producer of forage the Maple Creek Project also ensures live streams for stockwatering purposes. The contribution of the project is one that benefits not only the holders of irrigated land but also the farming community of the whole district.

Supplementing the grazing resources of the Maple Creek district are a number of natural, privately-owned flood-irrigation meadows, as well as some of the flood lands on the Upper and Lower "V" areas. These lands have a high water table unsuited for cultivated crops but capable of producing large amounts of forage for grazing.

#### SWIFT CURRENT IRRIGATION PROJECT

This project, deriving its water supply from the Duncairn Reservoir on Swift Current Creek, serves areas at Swift Current, Waldeck, Rush Lake and Herbert.

During 1954, P.F.R.A. completed a plane-table survey of the 2,340-acre Waldeck area. This work was done to assist the Conservation and Development Branch of the Provincial Department of Agriculture and also the Waldeck Water Users' Association. At the present time there are 24 farmers farming this irrigated area.

The Rush Lake area is divided into two blocks; North Rush Lake and South Rush Lake. In the North Rush Lake area 4,700 acres are served and this is divided into 116 plots of approximately 40 acres in size. Through subdivision there are 150 farmers holding lease agreements on the project and in addition 10 farmers are served with irrigation water on their own land. During 1954, 750 acres of forage crop were seeded bringing the total area under forage up to 2,200 acres. A further 800 acres are scheduled to be seeded in 1955.

There is a noticeable trend on this project for increasing livestock numbers and the production of forage crops. Farmers operating irrigated plots own the following livestock:-

5,405	cattle
370	horses
1,000	hogs
150	sheep
11,200	poultry

The South Rush Lake area located to the south of the C.P.R. tracks can be served by irrigation from the North Herbert Main Canal. A detailed engineering survey was conducted on this area in 1954 and as a result it is apparent that 2,665 acres can be irrigated. Of this acreage 1,900 acres are Crown Land controlled by P.F.R.A. and the balance is privately owned. During the past three years approximately 1,400 acres of this lake bottom have been under yearly cropping leases to farmers of the district. Subdivided into approximately 40-acre units the area has been operated by 42 farmers.

Considerable study has been given to a plan for developing this area. Ploughing, levelling and seeding to grass followed by the controlled application of irrigation water could turn this normally wet area into a high producing feed project.

The development in the Herbert district is under the control of the Conservation and Development Branch of the Saskatchewan Department of Agriculture. P.F.R.A. delivered water to this area in 1954 on the request of the Herbert Water Users' Association. At present there are over 5,000 acres in the entire Herbert area that can be served by irrigation.





Fig. 12. Ref. 3454

Irrigating a new, 20-acre alfalfa plot on the Bow River Project.

### ALBERTA

The active policy of resettlement of people from the drought prone areas of Saskatchewan and Alberta was carried on in the central block of the Bow River Project during 1954. In spite of a particularly adverse season due to the weather, the settlers are displaying a keenness which augurs well for the continued success of the project. Further details of this work will be found under the section dealing with the Bow River Project.

Resettlement on the St. Mary Irrigation Project is continuing under the direction of the Alberta Government.



## CONSTRUCTION, EQUIPMENT AND SUPPLY DIVISION

The diversity of work undertaken by P. F. R. A. requires a variety of services involving operation and maintenance of equipment, construction in concrete, steel and wood, and the introduction or development of special equipment for types of work not common in Western Canada.

The Construction, Equipment and Supply Division maintains and operates a number of construction machines which are available for small or unusual jobs or for maintenance work which would be difficult for local contractors to undertake. The equipment generally consists of special machines which will supplement the basic equipment which can be hired locally. One such machine which was tried out and purchased this year was a small, portable hydraulic dredge which is capable of canal desilting and excavation in water. This equipment can be very useful for some types of work but is not likely to be purchased by a local contractor due to its limited application. Some older units of equipment are traded in each year for new machines which are more suited to current requirements.



Fig. 13. Ref. 3833

The P. F. R. A. dredge "Arthur the First" in operation at the southeast end of Eyebrow Lake, Saskatchewan.

The trades shops at Moose Jaw continued to service and repair equipment and vehicles, prepare materials for construction and maintenance work and supply key personnel for various jobs being undertaken with P.F.R.A. forces. The shops at Vauxhall provide similar service for the Bow River Project.

A stock of repair parts, heavy construction materials and special materials not generally available from local suppliers is maintained to supply the needs of various projects. Much of this material, such as reinforcing steel and lumber for concrete forms, is partially processed or fabricated in the shops before being sent out to the job on which it is to be used. Water troughs for community pastures and camp trailers of various types are built in the shops during winter months for use the following year.

The allocation of vehicles, supervision of fire prevention and safety measures, and recording of a complete annual inventory are also responsibilities of this Division. More detailed attention to selection of vehicles for specific jobs and better supervision of maintenance has resulted in more satisfactory service from vehicles. A campaign of fire prevention has resulted in better preparedness in case of a fire and a general reduction in fire hazards in many places.

## ENGINEERING SERVICES

For many of its projects P.F.R.A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is seldom available from outside sources, the organization has set up a number of Divisions under the general heading of Engineering Services.

### HYDROLOGY DIVISION

This Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of projects. The studies undertaken may be classified under three general headings: flood potential determinations, water supply and utilization studies for specific projects and water supply and utilization studies on broad watershed bases. In addition to this work the Division acts as the Secretariat for the Prairie Provinces Water Board for which it also undertakes special studies.

During the year the flooding potential at several proposed damsites was studied and reported upon and in addition the flooding of agricultural lands in the Souris River Basin, upstream from Weyburn, was investigated. Water supply studies were undertaken for a number of water development projects, including Buffalo Pound Lake and the Upper Wascana Creek Basin.

A series of general watershed studies has been undertaken to this time to present an overall picture of future water supply and utilization in certain drainage basins. Information from such reports assists in the creation of a comprehensive water development plan, rather than one relating to a small portion only of the overall area. All factors relating to water supply and future use of water are given careful study. It is necessary at the outset to compile and process all existing hydrometric and meteorological data on the particular watershed. This is followed by an investigation of all existing and proposed water development projects in the area as well as the water rights pertaining thereto. The operators of important water development projects are interviewed to obtain a history of water use, an outline of present operations, problems and future plans. Local agricultural and other experts are consulted on probable future uses of water. Consideration is given to the effects of additional storage reservoirs, their methods of operation, potential flood hazards and stream measuring. Studies of this nature which have been undertaken and/or completed this year are as follows:-

Hydrology Report #7	"Water Supply & Irrigation in the Swift Current Creek Basin", January, 1955 (Completed in collaboration with the Swift Current District Office).
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Hydrology Report #8	"Water Supply & Irrigation in the Bigstick Lake Basin", February, 1955 (Completed).
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Hydrology Report #9	"Water Supply & Utilization in the Bow River Watershed" (nearly completed).
Hydrology Report #10	"Water Supply & Utilization in the Brightwater (Beaver) Creek Basin - Saskatchewan", (nearly completed in collaboration with the Moose Jaw District Office).
Hydrology Report	"Water Supply & Irrigation in the Frenchman River Basin". (Incomplete).
Hydrology Report	"Water Supply & Irrigation in the Ross Creek Basin". (Incomplete).
Hydrology Report	"Water Supply & Utilization in the Wascana Creek Basin". (Incomplete).

Acting for the Prairie Provinces Water Board the Division assisted in work arising out of its various meetings.

Assistance was again given to the Swift Current Experimental Station in the operation of the Davin Hydrology Research Station.

The Division also carried out a number of snow surveys in the winter of 1954-55 which, it is anticipated, will be of assistance in forecasting spring run-off volumes. Of particular importance is the snow survey work associated with estimates of run-off into Buffalo Pound Lake.

### SURVEYS DIVISION

Survey work plays an essential and major role in the P.F.R.A. planning program by providing field data relating to the location, design and construction of projects. P.F.R.A. surveys may be divided into three groups: surveys for structures, surveys for irrigation and reclamation planning, and legal surveys.

1. Structure surveys. The first stage in surveying for construction is the reconnaissance survey. Depending upon the size and complexity of a project this may vary from an on-the-spot appraisal by an experienced officer to the use of a number of survey parties for the preparation of maps. The objective is to obtain sufficient information to assess the feasibility of a project with a limited expenditure of time and money.

Assuming a project is feasible in the light of a reconnaissance survey a preliminary survey is then completed. This supplies details of topography and basic data in the vicinity of the proposed structure which is then utilized by the Soil Mechanics and Materials Division and the Design Division.



Once the project moves into construction, final surveys are made for the purpose of supplying lines and grades needed by the contractor. In addition they supply figures for the purpose of payment on material excavated or placed by the contractor.

2. Surveys for irrigation and reclamation planning follow in broad outline the same pattern of reconnaissance, preliminary and final surveys as discussed in the previous section. Aerial photography is being used increasingly in obtaining necessary preliminary topography where large areas are involved.

3. Legal surveys. These surveys are usually made for the purpose of acquiring transfer or title to the land and, hence, are made only for projects in the development stage. During 1954, five field parties were engaged on legal surveys in Alberta on the St. Mary Irrigation Project and the Bow River Project. In Saskatchewan two major projects were completed. These were a traverse of the entire shoreline of Buffalo Pound Lake and a right-of-way survey of the Moosomin Dam and Reservoir. In addition to these projects the original traverse and shoreline of Rush Lake was established together with other surveys such as roads, canal improvements, laterals and subdivisions in connection with the Swift Current Irrigation Project. Other legal surveys were carried out on community pastures in the south and northwest parts of the Province as well as on small water projects in the Coronach, Balcarres and Saskatoon districts.

Further details of surveys carried out under sections 1 and 2 will be discussed along with the individual projects concerned.

#### WILLIAM PEARCE IRRIGATION PROJECT (RED DEER RIVER PROJECT)

During 1954 a soil survey report on this project was completed. This work was carried out by Experimental Farm Service staff assisted by members of P.F.R.A. and the Alberta Research Council.

Survey work concerning the possible diversion of the Clearwater and North Saskatchewan Rivers into the Red Deer River was continued during the year.

#### SOIL MECHANICS AND MATERIALS DIVISION

The Soil Mechanics and Materials Division carries out studies and provides technical advice in connection with foundations, soils, concrete and other materials associated with water development projects. In the investigational stage this involves field exploration, sampling, testing, design studies and reports. Such work provides the basic information required to enable designs to be drawn up and estimates to be computed. In the constructional stage further detailed exploration is required along with construction control, additional testing, and the installation of special test apparatus. With the project in service the test apparatus is utilized to indicate the performance of the structures and to insure that seepage or deformation does not exceed tolerable limits.

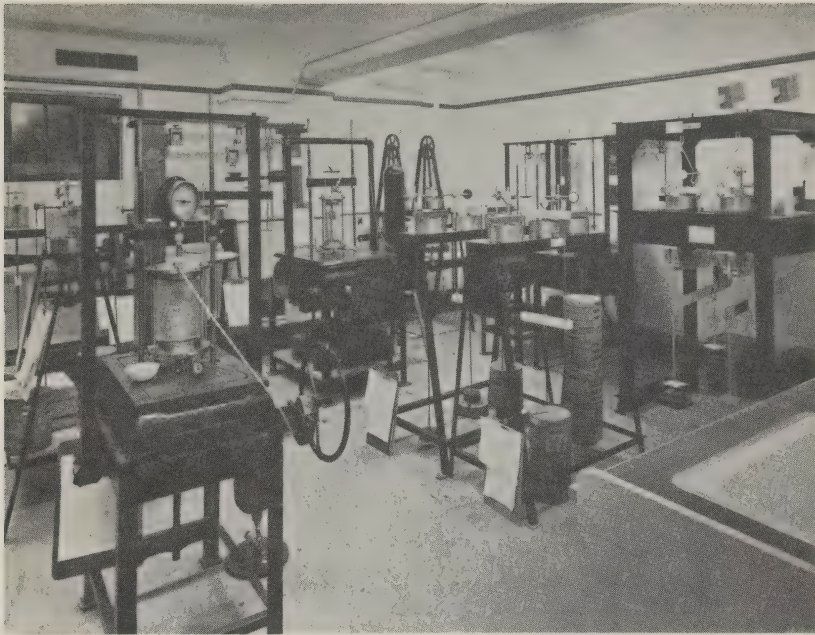


Fig. 14. Ref. C348

Triaxial shear and consolidation equipment in the Soil Mechanics and Materials Division Laboratory in Saskatoon, Saskatchewan.

One of the chief field activities of the Division involves the recovery of disturbed and undisturbed samples from bore holes. On projects where deep bore holes are required, use is made of truck-mounted rotary and cable tool drills. On projects where shallow sampling is adequate, use is made of power augers, hand operated washbore outfits, test pits and open excavations. The latter are particularly useful for very detailed work and for the exploration of concrete aggregate sources. In addition to recovering samples for laboratory testing, the actual testing or evaluation of the material in the field is being continually developed. Examples of such field testing are pumping tests to determine permeability; pile loading tests, and vane borer and penetration tests to evaluate the in situ shear strength. Even the best obtainable samples give only an approximation of conditions in the ground and therefore attempts are continually being made to improve the design of samplers and techniques used in sampling. As drilling and sampling is frequently slow and expensive some use has been made of indirect methods of soil exploration such as electrical resistivity.

The majority of the testing however, is carried out in the Soil Mechanics and Materials Division laboratory located at the University of Saskatchewan, in Saskatoon. Equipment required for tests on soils, concrete and concrete aggregates is available. In addition, under an agreement with the University, other

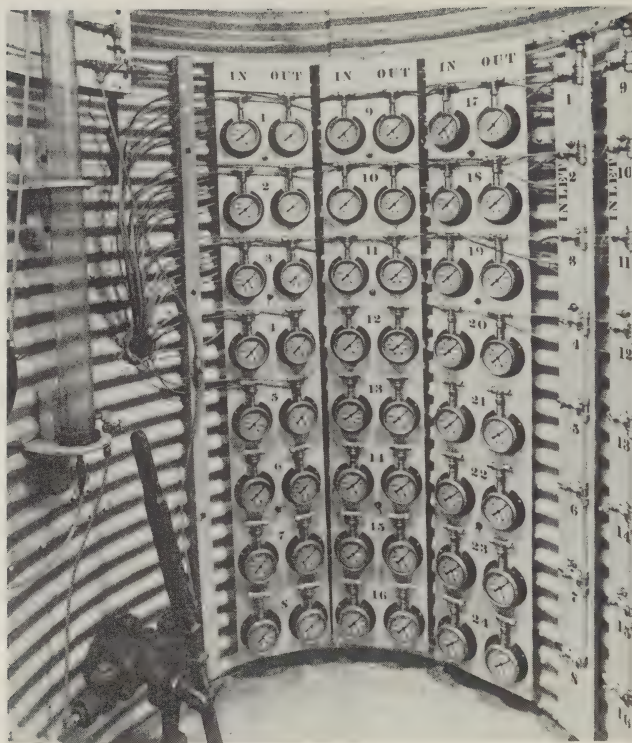


Fig. 15. Ref. C347

A terminal well showing gauges, and other equipment necessary to measure soil pore pressure in embankments and foundations. This type of equipment is used extensively by the Soil Mechanics and Materials Division.

University equipment is available for special tests. During the past year special equipment to test the shear strength of soils has been acquired for research on highly plastic clays. In the concrete section of the laboratory, additional equipment has been installed to test the physical properties of cements. While the majority of the testing is done in the Saskatoon laboratory, field laboratories located at the St. Mary Dam, Travers Dam and the site of the South Saskatchewan River Dam, carry out the routine work required for these major projects. In addition several small mobile field laboratories are available and have been used during the construction of the North Ridge Dam, Chin Dam, Berry Creek Dam, Morden Dam, Moosomin Dam and on the Buffalo Pound Lake Canal.

Since conditions in Western Canada are somewhat different from those encountered in other areas where extensive water development works have been



carried out, a good deal of practical research is required to arrive at the most efficient techniques and designs for P.F.R.A. projects. The following are the main research projects under way at the present time:

1. A study of the characteristics of the highly plastic clays which are so extensive in the West, and which have given much trouble in connection with structures founded upon them. This program involves an appraisal of their strength and consolidation characteristics and the application of these data in stability studies.
2. A similar study to the above on the clay shales which underlie the southern portion of the three Prairie Provinces. In this case the principal problem is to devise a satisfactory design to minimize heaving of light concrete structures placed on the shale.
3. A program to determine the most suitable lining materials and methods of application for seepage control in canals and dugouts. During the past year efforts have been concentrated on the development of a cheap bentonitic lining for dugouts.
4. The economical utilization of western aggregates for concrete structures, particularly at remote locations where limited quantities are required and elaborate processing equipment is not available. This involves a study of the tolerable percentage of silt and clay in aggregates to produce a durable concrete for hydraulic structures under severe climatic conditions.
5. A study of locally available cements, including alkali resistant cement.
6. A study of methods of concrete repair and particularly the matter of bonding new concrete work to old concrete.
7. Investigation of suitable techniques in winter concreting and in the curing of concrete.

#### AIR PHOTO ANALYSIS AND ENGINEERING GEOLOGY DIVISION

This Division, formerly referred to as the Air Surveys and Engineering Geology Division, carried out an extensive and important program of investigations during 1954. Work was undertaken in the three Prairie Provinces and also in British Columbia. At the request of the Royal Commission on Agriculture for Newfoundland, studies were continued in that province and by special arrangement with the Technical Services Branch of the Canadian Colombo Aid Plan work was carried out in Pakistan and Ceylon.

The projects covered included damsite appraisals; geological history studies; ground-water studies; mapping of surface deposits and land-use suitability; and erosion, irrigation, water development and allied studies.



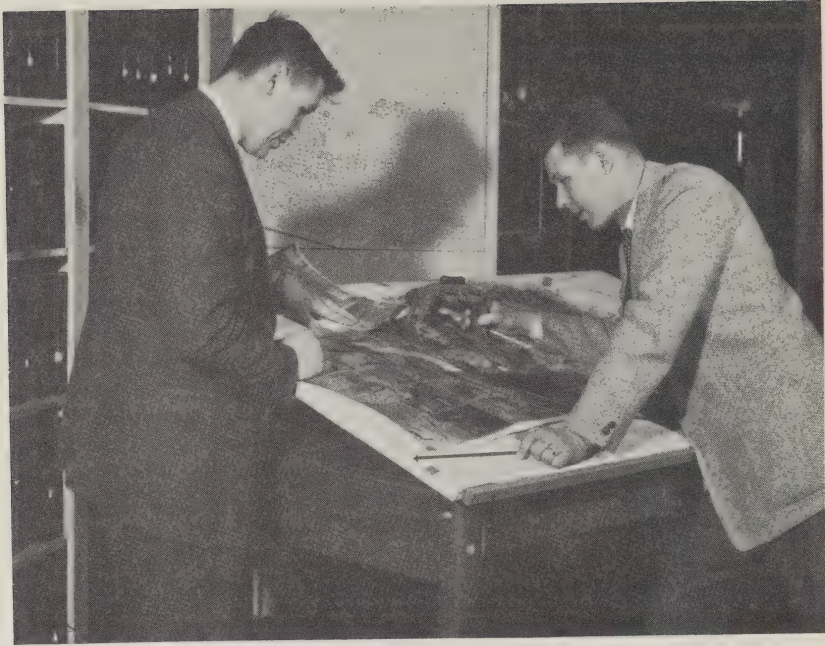


Fig. 16. Ref. 3769

The preparation and study of mosaics made up from aerial photographs forms a large part of the work of the Air Photo Analysis and Engineering Geology Division. In the background is a portion of the air photo library.

Damsite appraisals played a major role in the 1954 program of the Division. In British Columbia, on behalf of the Federal-Provincial Board, Fraser River Basin, a total of six sites were investigated. Five of these were located on the Clearwater River, a tributary of the North Thompson River, and one on the McGregor River northeast of Prince George. In southwestern Alberta damsites were investigated on the Waterton and Belly Rivers. This work is related to the diversion of extra water into the St. Mary Irrigation Project.

Geological history studies were carried out on the South Saskatchewan River in the proposed South Saskatchewan Damsite area. This was commenced during early summer and is expected to be completed early in 1955. To supplement the damsite investigations on the Waterton River mentioned above, a geological history report was prepared.

Groundwater studies were completed in Saskatchewan and Manitoba during 1954, chiefly in relation to the needs of various Community Pastures and prairie communities.

At the request of the Royal Commission on Agriculture for Newfoundland the Division carried out extensive work on the island. The purpose of this study was to establish the overall agricultural land-use potential. The entire island of approximately 43,000 square miles was mapped from airphotos in a period of five months. Shown on the maps were land classes based on observations of surface geological materials and other physical features which in turn are directly related to land-use suitability.

A number of small air survey projects were completed in the Prairie Provinces. These were related to erosion and sedimentation, storage reservoirs, flooding, site selection and location of earth borrow and aggregate. Aggregate searches from aerial photographs were carried out in the Cypress Lake, Val Marie, Pheasant Creek, Buffalo Pound and Purple Springs areas.

A large number of mosaics were prepared from the air photo library covering a wide range of projects. One of the largest orders for mosaics was to assist in a flood damage survey in the Riding and Duck Mountain region of Manitoba.

A paper was prepared describing the use of airphoto techniques for mapping sulphates and this was presented at Saskatoon to the Annual Western Regional Meeting of the Cement and Concrete Research Group.

As part of the Canadian Colombo Aid Plan the Division is currently supervising a soil mapping and land-use study being carried out with the use of aerial photographs in Western Pakistan.

Also under the Colombo Plan, by special arrangement, the Division is presently advising the Government of Ceylon as to the possible uses of aerial photography in furthering the development of the natural resources of that island.

During 1954 the aerial photographic coverage of the Canadian prairie region was extended to include a further 27,000 square miles. Of this additional area, 20,000 square miles were located northeast of Calgary, Alberta; 2,000 square miles in west-central Manitoba and the balance of 5,000 square miles in southwestern Manitoba.

#### DESIGN DIVISION

This Division is responsible for the major part of all engineering planning and design work for the organization. It relies for much of its basic information on the other Divisions of the Engineering Services Branch. All available information from these sources is collected and assessed before any design projects are commenced.

The type of work undertaken by the Division may be summarized as follows:-

- (a) The design and production of drawings for all major engineering works and structures.
- (b) The preparation of specifications and calling for tenders on large projects.
- (c) The handling of problems arising during construction which require special advice or research.
- (d) The inspection and study of maintenance or reconstruction problems which may arise on existing structures.
- (e) The provision of print reproduction services.

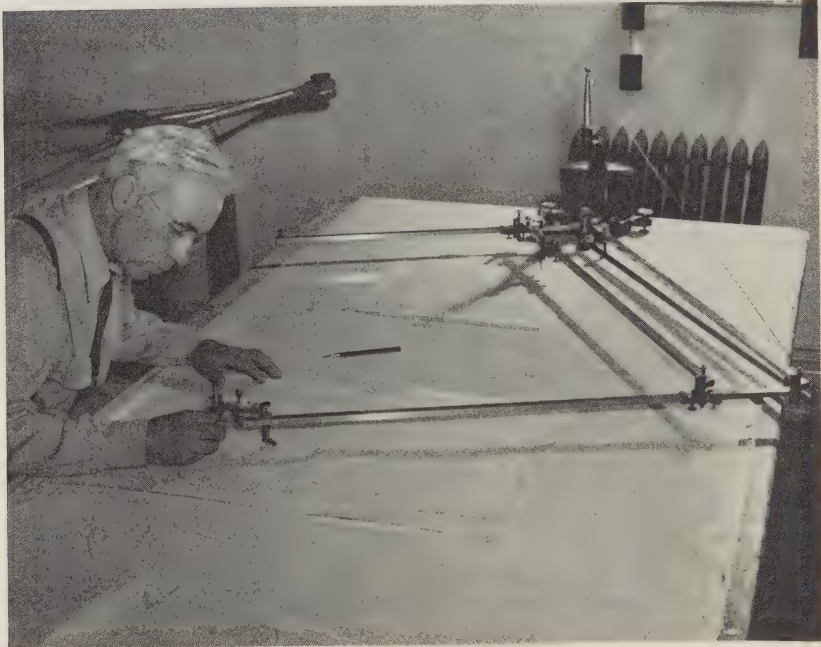


Fig. 17. Ref. 3847

In the Regina Design Division an operator works a pantograph machine producing small scale maps of portion of the Bow River Project.



During the year, some 20 separate designs of engineering projects were made and carried through to the awarding of a contract. The total amount of such contracts was approximately two million dollars. Other projects designed by the Division were constructed by force account or filed for subsequent construction. Studies of engineering and economic feasibility also called for considerable design work.

During the year the Division provided engineering, plans and specifications and certain field consultation for irrigation layouts on the Bow River Development for the Province of Alberta. This work was carried out in accordance with an agreement with the Province of Alberta and is in addition to major engineering works carried out under the P.F.R.A. program. The contract amount of the work in question was \$1,750,000.

Nearly all P.F.R.A. designs involved hydraulics in some form and consequently model testing by the hydraulics section was again an important part of the work of the Division. General hydraulic studies included tests on conduit inlet and outlet structures, conduit gate wells and chute-drop structures. Two design bulletins, covering the conduit inlet and outlet structures, have been prepared for general use. Other problems connected with specific designs required the construction of special scale models. Included in these was a large wasteway at Expanse Coulee and a siphon outlet structure for East Arrowwood Siphon. Both these are located on the Bow River Project.'

For the production of prints of maps and plans the Division maintains two ammonia, contact-type machines. During 1954-55 approximately 2,000 machine-hours of printing were registered.

### DRAINAGE AND RECLAMATION DIVISION

Drainage work undertaken by this Division is concerned only with P.F.R.A. projects and is directed towards defining areas requiring drainage, devising means of drainage and designing layouts. The need for such work has arisen out of the realization that adequate drainage is a prerequisite to the successful operation of any irrigation project.

Located at Vauxhall, Alberta, this Division has carried out drainage work on P.F.R.A. projects both in Alberta and Saskatchewan. Farm-use water studies, tile drain installations, salinity investigations, canal seepage loss studies and soils investigations are among the many phases of work carried on by the Division.

In Alberta, the activities of the Division were confined to the Bow River Project and the St. Mary Irrigation Project while in Saskatchewan work was carried out at Consul, Eastend, Maple Creek, Swift Current and Val Marie.





Fig. 18. Ref. 3716

A general view of the Drainage and Reclamation Division Laboratory at Vauxhall, Alberta.

## BOW RIVER PROJECT

Data was collected during the 1954 irrigation season relative to the amount of water applied to the various crops and an estimate was made of the waste water where it occurred. This information together with basic consumptive use studies is used to determine irrigation efficiency as well as water requirements under farm conditions.

During 1954 a total of 38,100 feet of tile drain was laid on the Bow River Project at an average cost of \$1.07 per foot. This drainage work is a necessary complement to the application of irrigation water.

In 1951, 175 permanent groundwater piezometers were installed on the project. These instruments, used to determine fluctuations in groundwater levels, were read three times during the 1954 season. Such information is a necessary adjunct to the operation of irrigation and drainage works.

Soils investigations carried out by the Division were related to soil types along the line of proposed drains to determine suitability for construction. In addition the location of some drains necessitated the relocation of dugouts and soil

investigations were carried out relative to the new sites. Approximately fifteen sections of land were also classified as to soil type as part of a soil rating classification necessary in determining the sale price of the land. Other soil work included the taking of undisturbed soil cores, profile studies and special investigations on individual farms.

During the year a detailed soil salinity survey was carried out on thirteen quarter sections of the Bow River Project. The survey outlined the boundaries of areas where crop growth was affected by salinity or waterlogging and recommendations were made for the improvement of these areas.

Investigations into the quality of the irrigation and drainage water showed that irrigation water can be rated as first class with a low soluble salt content. Drainage water, on the other hand, contained an appreciable quantity of soluble salts and there were indications of a downward trend in the rate of salt removal by open and tile drains.

Considerable emphasis was placed on canal seepage loss studies in 1954. This work is important in that comparative freedom from seepage means increased water supplies and in addition minimizes waterlogging of areas adjacent



Fig. 19. Ref. 3620

Drainage tile laying operations on the Bow River Project near Vauxhall, Alberta.





Fig. 20. Ref. 3618

Water discharging from a tile drain system on the Bow River Project near Vauxhall, Alberta.

to the canals. Water measuring techniques were tried out and a new type of lining involving a glass membrane and an asphalt solution was laid down.

In September, 1954, samples were taken from all the permanent soil sampling stations which were established in 1952. This work is designed to keep a check on salt concentrations. A further two lines of permanent sampling sites were established in 1954 in order to gather information relating to the influence of tile drains on neighbouring soils.

#### ST. MARY IRRIGATION PROJECT

At the request of the Colonization Branch, S.M.R.D., several parcels of land in the Medicine Hat area were investigated to assess possible problems of lateral seepage and existing salt accumulations. The relation of soil and topography to internal and external drainage was also given study. The irrigation possibilities of each parcel were assessed and where necessary recommendations were made relating to land levelling and other measures.

In the Taber area one set of piezometer readings was taken during the irrigation season to maintain a check on groundwater movements.

## SASKATCHEWAN

In June, 1954, all of the piezometers previously installed on the Swift Current, Val Marie, Eastend and Consul projects were read to maintain a record of groundwater levels. These readings served to establish several problem areas and in addition defined the extent of other known problem areas.

### CONSUL PROJECT

Canal seepage investigations were made on the Richardson Canal and an eight-inch tile drain was recommended and partially installed in order to relieve this situation.

Permanent soil sampling stations established in 1952 were sampled the same way as in previous years.

### EASTEND PROJECT

Three permanent soil sampling sites were resampled on this project to check on salinity, and drainage surveys were instituted on two new sites. The 440-acre Uglum Site, one of these areas, is part of an older irrigation system constructed with private capital. The investigation revealed that most of this area was well suited to irrigation both from a soils and topographic aspect. The survey of the Kendrick site revealed the need for surface and subsurface drainage although the general topography was suitable for irrigation.

Minor investigational work was carried out on this project to determine the most suitable depth and location for a tile drain to intercept seepage water currently causing sloughing of the adjacent river bank.

### MAPLE CREEK PROJECT

Over the years 1949 to 1953 considerable investigation was carried out on the Upper and Lower "V" projects in relation to drainage by pumping. In 1954 a start was made on a second 16-inch drainage well on the Upper "V" in order to remove as much water as possible from the large subsurface aquifer underlying the project. Drainage work was also carried out on Tenaille Lake and a 400-acre alkali slough west of the south end of the Upper "V". Both these areas are expected to be dry early in 1955. Lees Lake adjacent to the Lower "V" project has been lowered by two and one-half feet and a further drop can be achieved by deepening the drainage canal. A Ducks Unlimited dam to the south end of Bigstick Lake has also been opened and drained, thereby improving the situation at the lower end of the Lower "V".

Apart from drainage works groundwater observations were taken throughout the project and samples were collected from permanent soil sampling stations on the Lower "V", Upper "V" and Maple Creek Flats.



During the summer of 1954, the Division undertook a soil and drainage survey of a portion of the Bigstick Community Pasture with a view to assessing the suitability of the soils for irrigation and determining the drainage requirements necessary to supplement any such scheme. Further information relating to topography and water quality is necessary before any irrigation can be planned in this area.

#### SWIFT CURRENT PROJECT

Soil samples were taken from the permanent soil sampling stations in the Rush Lake area as a continued check on the concentrations and movement of salts. Further soils investigations in the same area were carried out to locate saline and waterlogged areas and assist in the designing of drainage systems to relieve these problems.

Elsewhere on the project the Division, at the request of the Experimental Station at Swift Current, completed a soil and drainage survey for a consumptive use of water study.

#### VAL MARIE PROJECT

The main work carried out on this project was the sampling of the permanent soil sampling stations set out in 1952 and the comparison with three other stations set down in 1950. All this work was related to the concentration and movement of salts.

All laboratory work for the Division was carried out in its own laboratory located at Vauxhall, Alberta.

#### STREAM BANK PROTECTION

Stream bank protection work in Manitoba was confined to further willow planting and maintenance on the exploratory areas along Edwards Creek near the town of Dauphin.

At no time during 1954 was Edwards Creek considered to be critically high and as a consequence bank protection structures and willow growth in particular had a good opportunity to attain their stabilizing effects.

During May and June, a total of 4,850 Laurel Leaf Willows were planted along with 7,650 Golden Willows. The former made particularly good growth during the season.

In August, it was observed that active toe-scour was threatening the upstream section of riprap of bank # 30 at Grey's Bridge. To combat this, two small wood-pile jetties were installed to deflect the stream flow away from this vital spot. In September, these jetties were overtopped as a result of a 2. 3-inch rainstorm but none-the-less the flow continued to be diverted to mid-stream.

This deflection has taken the strain off the riprap at this point and has caused deposition along approximately 100 feet of the riprap toe.

No work was done on any of the Assiniboine River banks near Brandon due to continuous high water stages of the river.

Fig. 21. Ref. 2765

A pile line revetment on  
bank #32, Edwards Creek,  
Manitoba, November 1952.  
Moderate silt deposition.



Fig. 22. Ref. 2964

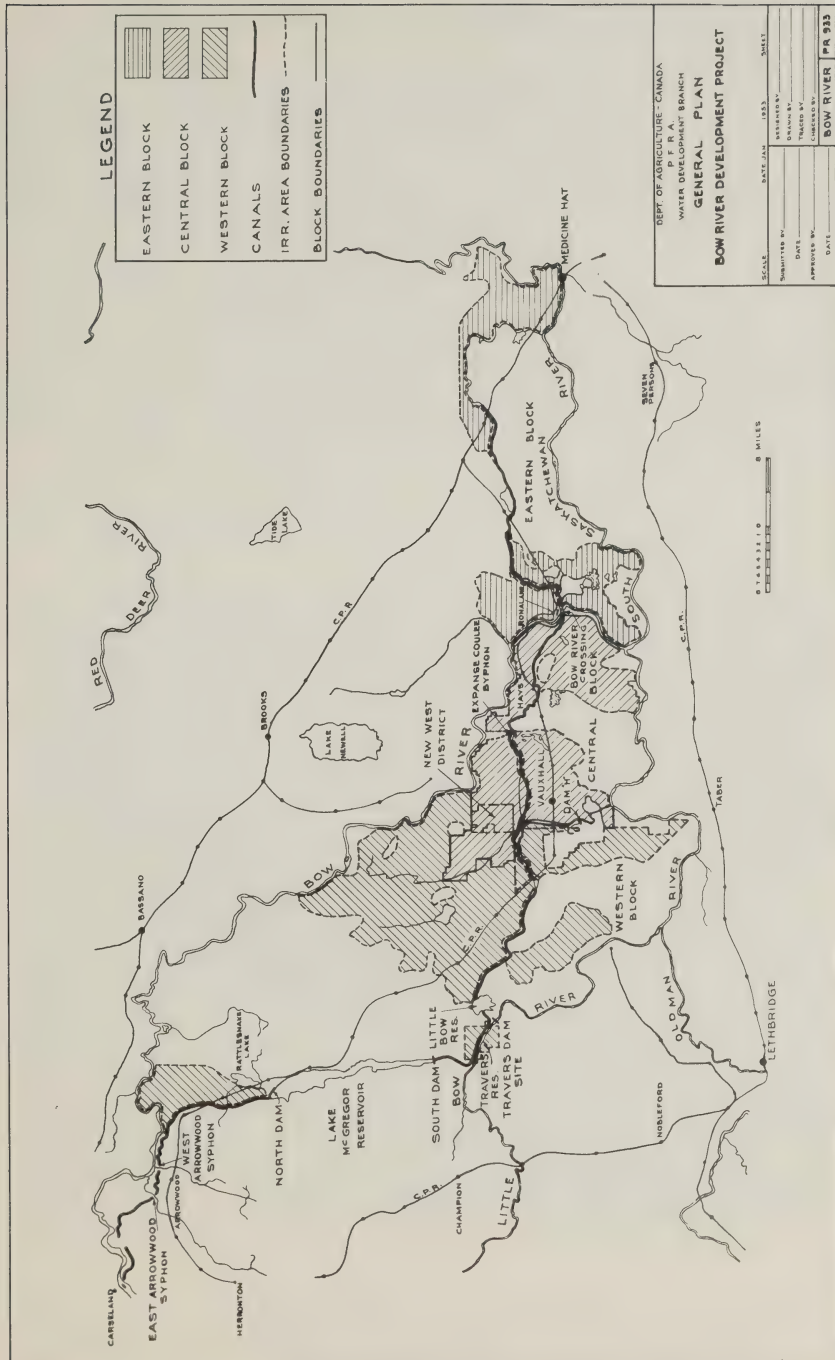
Bank #32 Edwards Creek  
showing heavy deposition  
after flood of June 2, 1953.



Fig. 23. Ref. 3685

Bank #32 Edwards Creek,  
showing consolidation of  
deposition with willows  
and sweet clover,  
September 30, 1954.







## MAJOR IRRIGATION AND RECLAMATION PROJECTS

The administration of Major Irrigation and Reclamation Projects, involving large expenditures of money, is undertaken by P.F.R.A. for the Government of Canada. These projects may be financed entirely by Canada through a special vote of Parliament or, on the other hand, they may be handled jointly by special agreement between Canada and the Province concerned. Major Irrigation and Reclamation Projects are sometimes referred to as Special Projects.

### THE BOW RIVER PROJECT

The fiscal year 1954-55 completes four years of P.F.R.A. construction and operation on the Bow River Project. Progress can be reported in all phases of the work. The first and major step in the development, namely the general renovation and enlargement of the project, is now almost completed.



Fig. 24. Ref. A941

The Travers Dam and Reservoir on The Little Bow River, Bow River Project. The main supply canal from the 265,000-acre-foot reservoir is located at the lower centre of the photograph.

## CONSTRUCTION

Cool weather in the spring of 1954 retarded construction operations and progress was slow throughout the summer. The exceptionally favourable weather from late September to the end of the year however, made up for the spring and summer, allowing most contracts to be completed.

At the western end of the project repair work was completed on both the north and south weirs of the Carseland diversion dam on the Bow River, while to the east a new wasteway was completed just above the West Arrowwood Siphon. P.F.R.A. forces have been working on repairs to the East Arrowwood Siphon through the winter. Old supporting pedestals that have heaved are being replaced with new pedestals with timber cradles. The siphon itself is being extended by about 100 feet and a new outlet structure is being installed. These measures are undertaken to overcome an erosion problem at the siphon outlet. Approximately three miles downstream from the East Arrowwood Siphon the Shouldice Check structure was completed. Both the north and south dams on the Lake McGregor Reservoir were strengthened during the year by the addition of further fill. On the south dam five additional gate leaves were installed on the outlet structure. Within the reservoir itself, which was held at low water during the season, channel excavation was carried out on lake bed summits to facilitate low water deliveries. The canal connecting Lake McGregor and Travers Reservoir was widened and deepened in 1954.

The 4,500,000 cu. yd. Travers Dam was officially opened on July 13, 1954 by the Minister of Agriculture. The total cost of the dam and its associated structures was approximately \$2,765,000.00. The reservoir created by this structure contains 265,000 acre-feet of water, 100,000 acre-feet of which is classified as useable storage. The Bow River Project now has a total of five reservoirs with a combined capacity of 605,030 acre-feet. The useable portion of this storage is 343,275 acre-feet.

On that section of the project east of the Little Bow Reservoir to the Expanse Coulee Siphon two major contracts were completed to bring the main canal up to the required capacity of 2,700 cubic feet per second. In the same section three drop structures were also completed along with a wasteway above the Expanse Coulee Siphon.

East of Expanse Coulee to the Bow River Crossing at Ronalane a further contract has been completed on canal enlargement and bank strengthening. Four new checks were also constructed in this section of the canal. One contract was completed in this section for the construction of distribution works. This resulted in a total of 6,500 acres being added to the irrigated area in the Hays District. A further contract covering 1,200 acres was let at the end of the season.

The area now under irrigation over the entire Bow River Project is close to 100,000 acres. Further acreage is being developed continually and settlement



Fig. 25. Ref. A931

Reservoir #1 in the Hays District of the Bow River Project contributes 17,630 acre-feet to the total project storage of 605,030 acre-feet.

of these new areas follows immediately. On the Western Block of the project the Government of Alberta is currently installing a distribution system designed to meet the needs of a further 65,000 acres.

At this stage the main construction work for the initial development of the Bow River project is completed. The main canal from Carseland to Ronalane has been improved to the point where it is able to deliver water effectively to meet the ultimate needs of the project. The checks, drops and turnouts on the canal have been put in, although additional structures will be required when water is supplied to new areas. While some further strengthening will be required on the Lake McGregor Dams, all other reservoirs are now completed.

#### OPERATION AND MAINTENANCE

The precipitation at Vauxhall during 1954 totalled 15.07 inches compared with the average of 13.06 inches. However, the distribution was far from ideal from the point of view of crop production and as a result the demand for irrigation water was high. A total of 57,915 acre-feet was delivered to the farmers' head-gates. In the Vauxhall area 439 farm units received 41,505 acre-feet of water and over 138 farm units in the Hays area used 16,410 acre-feet. This compares with a total of 16,938 acre-feet delivered to the entire project in 1953.



On August 2nd and 3rd two disastrous hailstorms passed through the project and it was estimated that 80 per cent of the area suffered losses as a consequence. In most cases losses were high, frequently involving 100 per cent destruction.

In the Hays area water was delivered for the first time to 64 units comprising a total of 6,500 acres. To serve this area an additional ditch-rider was employed and two new ditch-rider houses were built. A new house was built at the Little Bow Reservoir to accommodate the gatekeeper controlling gates on the Little Bow, Travers and Lake McGregor Reservoirs.

At the present time the Hays area has a livestock population of 749 cattle, 1,073 sheep and 100 hogs.

Canal flows in the main canal were heavy during the year, especially when it is considered that the section from Carseland to Lake McGregor was operative only part time due to construction. A total of 192,000 acre-feet was diverted from the Bow River and 207,000 acre-feet was taken from the Lake McGregor Reservoir to fill Travers Reservoir and meet irrigation needs.

A total of 17.7 miles of ditches were either renewed or constructed by dragline during the season along with 5.4 miles of smaller laterals excavated by P.F.R.A. equipment.

Operations and maintenance crews erected or rebuilt 289 structures, 67 of which were concrete. A further 50 structures were repaired.

#### DRAINAGE

A total of 29 miles of open drains were excavated during 1954, mostly by hired draglines, on a unit price basis. The cost per lineal foot was 22.8¢. Nine thousand feet of open drains were cleaned during the year. Ditching dynamite used on one section of this work proved effective.

Tile drains were laid over a total distance of 7.2 miles by P.F.R.A. forces; the tile used being in two sizes, eight and ten inches. These drains are installed to facilitate both surface and subsurface drainage and on occasion are used to intercept damaging canal seepage. This type of drain requires no land to be out of production and maintenance costs are lower than in the case of open drains.

In addition to the above work 2,950 feet of corrugated galvanized iron culvert were laid in the drains under road allowances and farm crossings as well as serving as outlets from the fields to the drains. Eight pipe drop structures were installed in drains to eliminate erosion troubles. Further work included the levelling of 20 miles of spoil bank.

Further details on this work will be found under the section dealing with the Drainage and Reclamation Division.





Fig. 26. Ref. A938

The south section of the Hays irrigation development, Bow River Project, showing the contrast between irrigated and non-irrigated land.

## RESETTLEMENT AND ECONOMIC PROGRESS

The completion of Travers Dam during 1954 ensured adequate water for the project and as a result resettlement work was increased. Fifty-five settlers were allocated land in the Hays area and twenty-five farmers were located on land at Vauxhall. At Hays, land was prepared for the settlers at cost by breaking with a Noble blade and discing twice.

During the year 31 parcels of land were prepared for settlement in 1955. These, plus an additional 44 not previously settled, will mean 75 new settlers can be accommodated in the spring of 1955. A total of 3,690 acres of land was prepared during the year and rough levelling and farm fills have been put in on 31 parcels while farm ditches have been excavated on 21 parcels. In December, 40 parcels were allocated and it is expected that all presently available land will be taken up in 1955.

Crop yields in the Hays area were disappointing. This was due almost entirely to the two extremely severe hailstorms which devastated the area. Such an occurrence, while unavoidable, was a severe blow to the settlers just getting started. In spite of this setback however, a spirit of optimism prevails in the area concerned.

During the year a bank has been erected at the hamlet of Hays, telephones have been installed and a three-room school is in operation. Rural electrification supplying 56 farms has been put in to the Armelgra tract and this also serves the hamlet. The Hays area was brought within the Taber Municipal District in 1954 and 20 miles of road were gravelled in the fall.

At Vauxhall a new hardware store has been established and a number of new residences built. Since 1950 the population of Vauxhall has increased by 190 to its present level of over 650.

#### COLLECTIONS ON CONTRACTS

In spite of the severe crop losses due to hail, the water rate collections have been satisfactory. Some delay in payments is expected until livestock are marketed.



Fig. 27. Ref. A920

The hamlet of Hays, Alberta.



## THE ST. MARY IRRIGATION PROJECT

While the prairies generally had above normal rainfall during the 1954 crop season, the western portion of the St. Mary Project area received slightly less than normal precipitation. The total precipitation from April through August at Lethbridge was 8.61 inches against a normal of 8.90 inches. At Medicine hat, however, the rainfall totalled 10.85 inches for the same period as against a normal of 8.01 inches. The early part of the summer was cool and this resulted in heavy use of irrigation water late in the season. Peak canal discharge from the St. Mary Reservoir reached 1,700 cubic feet per second or nearly double the previous record. The total water used for the season was 246,400 acre-feet applied to 158,000 acres.

During 1954 water was carried entirely by new canal from the St. Mary Reservoir to Medicine Hat for the first time. This canal has been constructed during the last five years and is 220 miles in length. Its capacity varies from 3,300 cubic feet per second at the upper end to 6 cubic feet per second at the lower end.



Fig. 28. Ref. 3527

St. Mary Irrigation Project brings water to a sheep ranch near Bow Island, Alberta.





An indication of the progress made in the development of the St. Mary Project is given by the following table:

<u>Season</u>	<u>New Distri- bution Works Ready to Serve a Total of:</u>	<u>Old Districts Served Approx:</u>	<u>Water Delivered To a Total of:</u>	<u>Water Delivered Acre-Feet:</u>
1952	37,000ac.	118,000ac.	130,000ac.	186,000.
1953	54,000ac.	118,000ac.	135,000ac.	196,000.
1954	96,000ac.	118,000ac.	158,000ac.	246,400.
1955	141,000ac.			



Fig. 29. Ref. 3528

Hay baling on irrigated land near Fincastle, Alberta, on the St. Mary Irrigation Project.

## CONSTRUCTION

Construction work during 1954 was confined mainly to distribution works, all financed by the Provincial Government under the terms of the original Federal-Provincial Agreement. A total of three contracts started in 1953 were completed, another three were started and completed while a further three were started but remained incomplete at the year's end.

Construction by the Government of Canada was confined to works around Ridge Reservoir, gravelling of operational roads on canal banks and the development of the operation and maintenance camp at the St. Mary Dam. Installation of the second barrel of the Pinepound Siphon was also commenced. On completion this will allow the main supply canal to function at full capacity.

Total expenditures from the inception of the project to March 31, 1955, in accordance with the agreement between the two Governments are approximately as follows:

Government of Canada (Through P.F.R.A.) \$14,821,000.00

Government of Alberta \$14,949,000.00



Fig. 30. Ref. 3472

The Canadian Sugar Factories Limited plant at Taber, Alberta. Sugar beets grown on the St. Mary Irrigation Project are processed here.

## OPERATION AND MAINTENANCE

The operation and maintenance organization of the P.F.R.A., located at the St. Mary Dam, operated the St. Mary, Pothole and Ridge Reservoirs, along with 28 miles of connecting main canals. Considerable maintenance and improvement work was done by this crew during the fall and winter, after the water had been shut off.

### THE SOUTH SASKATCHEWAN RIVER PROJECT

Field work on the South Saskatchewan River Project was somewhat less than in previous years.

Hydrographic measurements were taken at a number of points on the South Saskatchewan River during the year. Gauges were read regularly on #15 and #45 Highway bridges as well as on baseline R-6 at the Coteau Damsite. Five streamflow measurements were made on the South Saskatchewan River from the bridge on Highway #15. These involved a total of about 500 separate velocity measurements. Only three streamflow measurements were made on Summit and Ridge Creeks in early spring as the run-off at that time was very small.

Surveys were extended at the Coteau Damsite to facilitate an investigation into an alternative site layout. Check surveys were also made on a series of monuments at the damsite to determine any movement of the valley slopes. Further detailed topography was taken at the Summit Damsite area in relation to a possible shift in alignment of the Summit Dam as well as to further the study of alternative routes for a proposed railway line. Within the irrigable area a further 11,460 acres of topography have been taken to complete the work in the Laura region. During 1954-55 the following topography has been taken:

400 ft to the inch, 5 foot contours.	11,460 acres
200 ft to the inch, 5 foot contours.	1,000 acres
200 ft to the inch, 2 foot contours.	<u>960 acres</u>
	<u>13,420 acres</u>

Drilling and foundation investigations were carried out on both the Coteau and Summit Damsites during 1954. At the Coteau site some 55 churn and rotary drill holes were sunk near the south end of the damsite area, which had not been drilled extensively in the past. A further six test pits were hand excavated in the gravel area on the west abutment in order to complete the picture of availability of pervious construction material.

At the Summit Damsite an extensive drilling program, involving some 180 holes, was completed. Information derived from this work gives a complete





Fig. 31A. Ref. 3848

Mr. Wendell E. Johnson -  
Chief Engineering Division,  
Missouri River Division,  
United States Army Corps  
of Engineers.



Fig. 31B. Ref. 3848

Dr. Karl Terzaghi - Professor  
of the Practice of Civil  
Engineering, Division of  
Engineering Sciences,  
Harvard University.



Fig. 31C. Ref. 3848

Dr. A. Casagrande - Professor  
of Soil Mechanics and  
Foundation Engineering,  
Harvard University.



picture of the foundation conditions and the availability of borrow material at this damsite. This location now appears to be the most likely one for the large dam in the Qu'Appelle Valley required as an integral part of the South Saskatchewan River Project.

During the first three days of March, 1955, engineering personnel from P.F.R.A. met in Cambridge, Mass., with the three-man board of consultants on the South Saskatchewan River Project. The members of this board are Dr. Karl Terzaghi, Dr. A. Casagrande and Mr. Wendell Johnson, representing expert opinion on such topics as geology, soil mechanics and earth dam construction generally. At the meeting approval was given to plans and specifications relating to the construction of the project and further investigations into certain specific phases were recommended.

### THE SASKATCHEWAN RIVER RECLAMATION PROJECT

The lower course of the Saskatchewan River traverses a flat, marshy, delta area where most of the transported sediment is deposited. The clay and silt soils which go to make up most of this 2,000,000-acre region have been investigated by soil scientists who report that, when properly drained, this area is capable of being converted into good farm lands.

In view of this the P.F.R.A. has, since 1950, been engaged in an investigation of the river in relation to the reclamation possibilities of the area. As a result of these studies a start was made in 1953 on the actual development of the Pasquia Area, situated near the town of The Pas, Manitoba. During the fiscal year 1954-55 this work was continued while at the same time further investigational work was carried out elsewhere in the delta region.

During the early part of the fiscal year it was decided that extensive hydrometric and sediment surveys would be required in order to solve the various problems connected with the Saskatchewan River Reclamation Project. The services of a consulting hydraulic engineer were retained during the planning stage of these surveys.

Hydrometric and sediment surveys were started in the early part of May and completed during the last half of September. A total of four parties, each consisting of an engineer, an assistant and a local helper, were responsible for this phase of the field work. The flow on the Saskatchewan River system was well above average during the year, allowing the field parties to accumulate a very satisfactory amount of data.

Concurrently with the above surveys an office staff of three engineers, two assistants and three draftsmen were engaged upon the work of interpreting the results. This work will determine the average annual flow of sediment, the sedimentation rate in critical areas as well as lake and river stages during



Fig. 32. Ref. 3441

One of four hydrometric survey crews at work on the Saskatchewan River. This party camped for the summer at the source of the Sipanok Channel in Saskatchewan.

extreme flood conditions. This important work is fundamental to the design of an overall reclamation scheme and several years investigational work are necessary before the basic information can be interpreted for an engineering plan.

## PASQUIA PROJECT

During 1954 an active construction program was continued in the Pasquia Area. This project, forming part of the larger Saskatchewan River Reclamation Project, covers an area of 135,000 acres which is in the process of being reclaimed from recurrent flooding.

A considerable amount of time was spent on raising and sloping dikes which had been constructed in 1953 and, as a result of extremely wet conditions, were not finished during that year. These dikes were seeded to grass just before freeze-up. A diversion dam was constructed on the Pasquia River during September and October. This dam, built with rented equipment, contains some 50,000 cubic yards of earth. The final diversion of the Pasquia River was





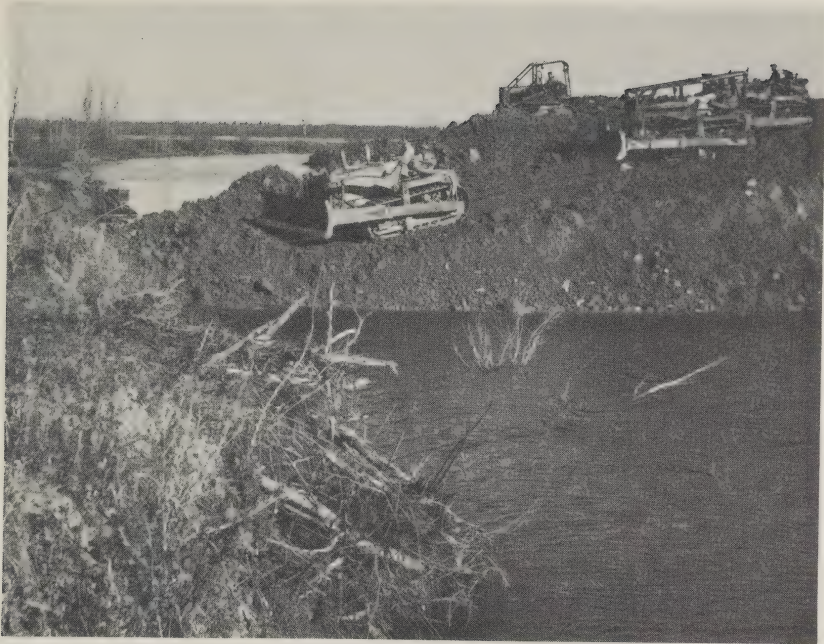


Fig. 33. Ref. 3631

Heavy equipment makes the closure on the Pasquia River diversion dam, located approximately 30 miles up stream from The Pas, Manitoba.

effected on October 18th, 1954 and the river is now filling up a large flood plain upstream from the dam. This process will take some time and it is not expected that the diverted flow from the Pasquia will reach the Carrot River until the spring of 1955.

One diking contract amounting to approximately 17 miles was 90 per cent completed during the year while a second contract for approximately 6 miles was only 10 per cent completed due to particularly adverse weather conditions. A contract was also let for the construction of a control dam on the Pasquia River on the outskirts of The Pas. Very little work was undertaken on this contract as a result of an extremely high stage on the Saskatchewan River. It is expected however, that this structure will be completed in 1955.





Fig. 34. Ref. 3636

A typical section of dike that has been trimmed and seeded on the Pasquia Project.

Survey work consisted largely of plane-table surveys, stadia surveys, levels and cross-sections. Dike centre-lines were established with all the necessary levels and slope-stakes for construction. Completed sections of dike have also been cross-sectioned for the purpose of determining earth quantities. A profile was taken of the Pasquia River diversion and additional topography was recorded for alternative sites for the proposed control dam on the Pasquia River near The Pas. The Soil Mechanics and Materials Division also undertook investigational work on the two sites mentioned above.

Office studies on the internal drainage of the area were continued and a report prepared. It was decided that a number of main drainage canals and two pumping plants would be constructed during 1955 and 1956.

OTHER SPECIAL PROJECTS

BRITISH COLUMBIA PROJECTS

The activities of the Prairie Farm Rehabilitation Administration in the Province of British Columbia during 1954, can be classified under the following headings:

- A. Special projects for Veterans' Land Act.
  - 1. Under Construction
  - 2. Under Operation and Improvement.
- B. Special projects under joint sponsorship with the Province of British Columbia.
  - 1. Under Operation and Improvement
  - 2. Under Investigation.

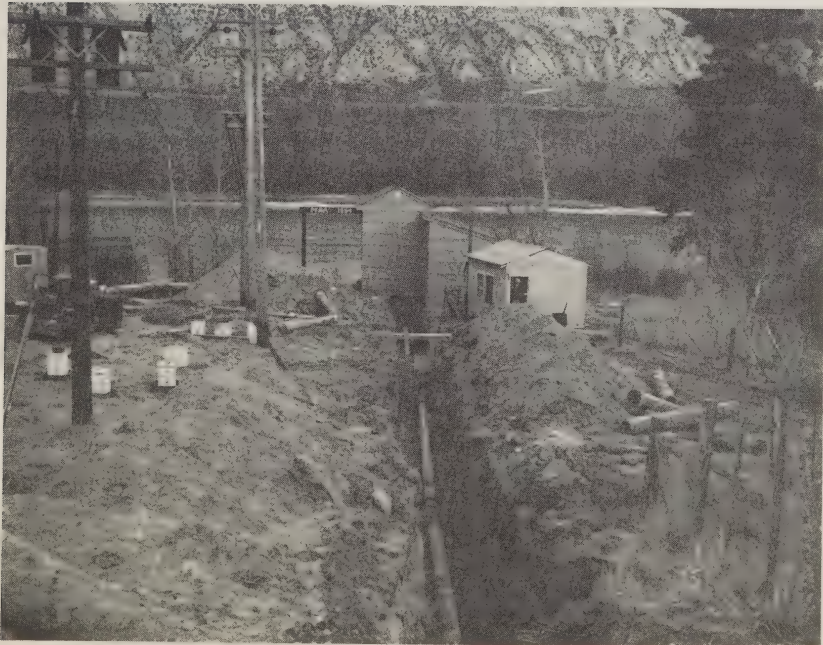


Fig. 35. Ref. C350

The pumping station installed on the Johnston Western Canada Ranching Project to provide water for 50 small holdings and 10 full-time farm units. This project is located six miles east of Kamloops, British Columbia.





Fig. 36. Ref. C351

Service roads established for settlement on the Johnston Western Canada Ranching Project, Kamloops, British Columbia.

C. Project construction and investigation for other agencies.

Those projects under Section A1 are as follows:-

JOHNSTON WESTERN CANADA RANCHING EXTENSION

This project, supplied with water pumped from the South Thompson River, was initially completed in 1948. Water on the project was distributed by metal flumes and earth canals and trouble has been experienced in maintaining the grades on these works due to unforeseen soil characteristics. In addition to the original fifteen, ten-acre, full-time farms on the project there was also a number of side-hill lots and fringe areas adjacent to the saline flats which were not settled. In view of these factors and the increasing demand for small holdings close to Kamloops the Veterans' Land Act received assistance to subdivide the unsettled areas into 50 small holdings and convert the existing works into a pressure-pipe distribution system.

Construction on this project was commenced in November, 1954, and was within one month of going into operation by the end of the fiscal year. Immediate settlement is taking place on about 50 per cent of the new properties.

Those projects under Section A 2 are as follows:

#### PENTICTON WEST BENCH

This project was completed in May, 1954, and at the present time all the lots have been settled by veterans.

During the season some difficulty arose in relation to the operation of the three vertical turbine pumps on the project. The suppliers of this equipment are replacing the defective impeller assemblies and these will be installed and tested prior to the 1955 irrigation season.

#### WESTBANK (LAKEVIEW IRRIGATION DISTRICT)

Settlement of this project, located opposite Kelowna, is now 90 per cent completed and the Irrigation District has assumed full responsibility for operation and maintenance.

Following one year's use severe electrolytic corrosion occurred on the steel pressure-pipe system on this project. Cathodic protection was installed on the areas most severely attacked and this action is arresting, if not eliminating, the corrosion.

During the past year further tests have been completed over the remainder of the irrigable area and along the main line. These tests revealed corrosion of all pipes in varying degrees. As a consequence nine additional anode beds have been installed.

In the two years since cathodic protection was installed on the two initial test sections only one leak has occurred. A projection of the "leak incidence curve" without such protection would anticipate the occurrence of 148 leaks each year.

#### CAWSTON BENCHES

This project, comprising 624 acres of bench lands three miles south of Keremeos, has been operated by the Fairview Heights Irrigation District for the past four years. The water for this project is pumped from the Similkameen River by three pumps with a combined capacity of 510 horsepower.

During 1954 P.F.R.A. assisted the Irrigation District by installing a large capacity air cooler at the pumphouse. This alleviated problems arising out of operating the motors in extremely hot weather. In addition, P.F.R.A. crews installed a new log boom for the protection of the rock-filled crib dam on the District's Otter Lake Reservoir, 17 miles west of Princeton.



Those projects under Section B 1 are as follows:

#### LILLOOET VALLEY RECLAMATION

This diking and drainage project is located some 100 miles north of Vancouver within the Lillooet River Valley. The scheme involves the eventual reclamation of some 14,000 acres of highly productive agricultural land.

The work on the project was commenced in 1946 and completed in 1953 with the Diking District assuming full responsibility for the operation and maintenance of the project since that date.

During 1954 P. F. R. A. provided further engineering assistance to the District.



Fig. 37. Ref. C352

The Lillooet River looking upstream from the Pemberton-Creekside Highway Bridge. At this point during low flow, the water level has been reduced three feet as a result of the lowering of Lillooet Lake two years ago. This development has improved the drainage from nearby agricultural land.

Those projects under Section B 2 are as follows:

#### SALMON ARM

This project, covering approximately 6,400 acres, is situated just south and east of the town of Salmon Arm.

Surveys have been carried out on the ditch, flume and pipe siphons required to bring water to the irrigable area from Hunters Range across the Shuswap River. Cost estimates and preliminary reports are in the course of preparation.

#### CUISSON CREEK

Located near Marguerite, British Columbia, the proposed 2,680-acre Cuisson Creek Project would derive its water from Cuisson Creek and in addition from Red Top Lake. At the present time the reliability of short term water resource records are in some doubt and a final report on the project will not be completed before the summer of 1955.

#### B.C. FRUITLANDS IRRIGATION DISTRICT

This is a 3,000-acre project renovation adjacent to Kamloops. The renovation would involve a conversion to a pressure system with water pumped from the Thompson Rivers.

A complete resume of all P.F.R.A. engineering investigations from 1951 to 1954 was prepared for the British Columbia Government.

#### GOAT RIVER

This project is located on the lower reaches of the Goat River at the confluence of this stream with the Kootenay River, immediately adjacent to the Creston Flats.

Flooding and erosion are the problems to be overcome, and depending upon the extent of the works undertaken, up to 600 acres could be reclaimed or protected.

The Co-ordinating Committee for Land Reclamation is doubtful concerning the productivity and use of the lands in question and a final report by P.F.R.A. will not be available until the Committee has been satisfied as to the project's land values.

The projects under Section C were entirely financed, as far as field activity was involved, by the agency concerned. However, cost-free consulting services were provided by various Divisions of the P.F.R.A. Engineering Services Branch.

## FEDERAL-PROVINCIAL BOARD, FRASER RIVER BASIN PROJECTS.

During 1954 P.F.R.A. undertook investigations on three projects for the above Board.

Preliminary design work was carried out for flood control works on Harrison Lake. This design covers an earth-and rock-fill dam at the outlet of Harrison Lake, a hydraulic-fill dike across the south end of the lake close to Harrison Hot Springs Village, and a lock to permit navigation between Harrison River and Harrison Lake when the latter is maintained at higher levels during, and immediately after, the freshet period.

On the Clearwater River further ground and aerial surveys were carried out as well as ground geological investigations. This work was planned to provide accurate topographic maps and also to gain information on a number of possible reservoir and hydro power sites.

On the McGregor River a ground survey crew established 59 points to allow the area to be mapped by aerial methods. The establishment of these points

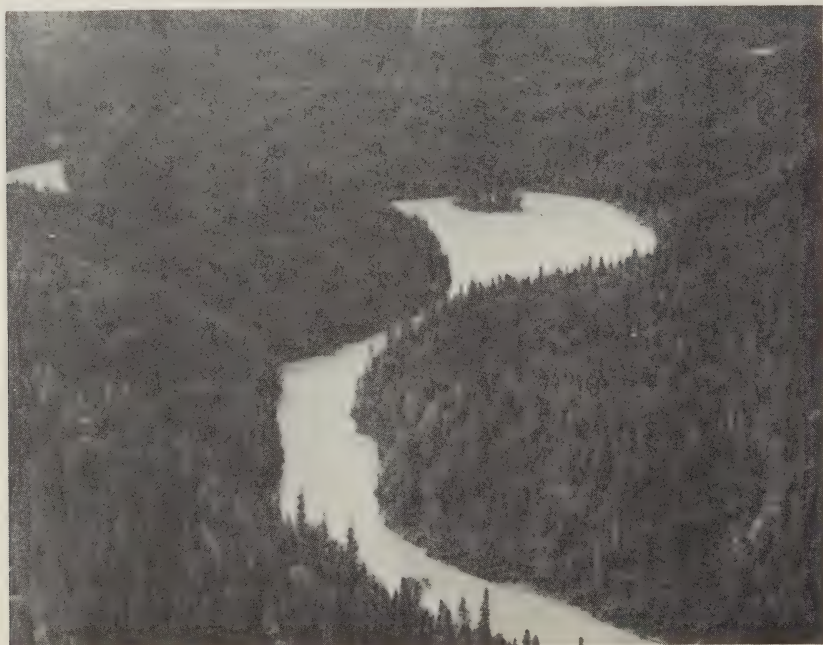


Fig. 38. Ref. C353

The McGregor River at the Lower Canyon. The proposed dam would be located in the straight reach in the centre of the picture.



involved 76 miles of stadia traverse and levels. It is expected that maps to the scale of 1 inch equals 1,000 feet, with 50 foot contours, will be ready by June, 1955. Along with the maps pondage calculations will also be completed. In the Lower Canyon of the McGregor River a geological reconnaissance was followed by a surface geological exploration at a proposed damsite. A final report has been submitted recommending initial foundation explorations for a 200-foot-high dam at the site proposed.

## SASKATCHEWAN PROJECTS

### BUFFALO POUND STORAGE PROJECT

In 1940, a dam was completed at the east end of Buffalo Pound Lake to provide a storage reservoir in the Qu'Appelle Valley. In recent years surveys have been conducted to determine methods of maintaining this storage at its maximum level. At the present time the plan is to divert water from the South Saskatchewan River into the Qu'Appelle Valley by pumping. This coupled with an attempt to increase the natural flow of water in the Qu'Appelle constitute the overall approach.

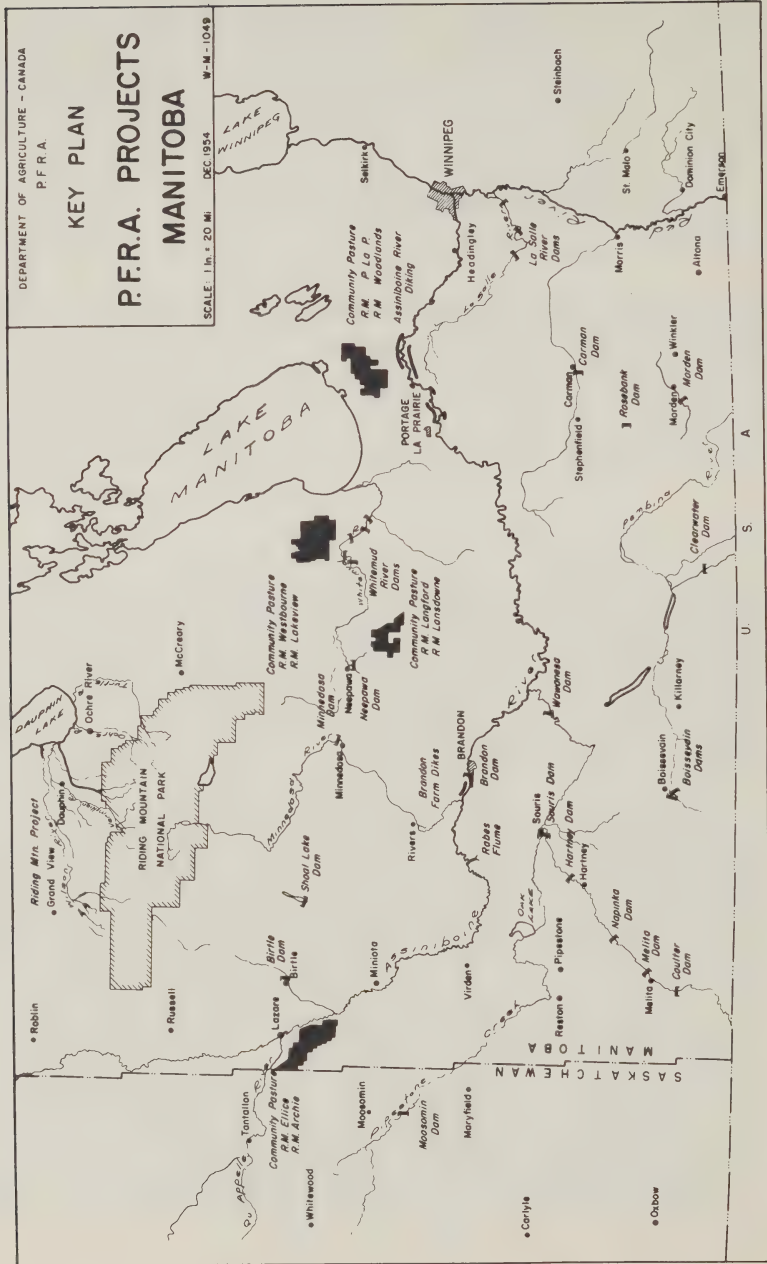
To achieve the end outlined above it will be necessary to raise the water a vertical distance of 107 feet from the South Saskatchewan River and deliver it at the Summit of the Qu'Appelle Valley, a distance of 12 miles. From this point a number of channel improvement works are necessary along the course of the valley to the Buffalo Pound Reservoir. In order to increase the natural flow in the Qu'Appelle River, damsite possibilities on the Ridge, Squaw and Moose Jaw Creeks have been investigated. All these streams are tributary to the Qu'Appelle River. Improvement work on the present dam at Buffalo Pound Lake will also be necessary in conjunction with the development.

Preliminary survey work involving centre-line profiles and site topography was carried out for proposed damsites on Ridge and Squaw Creeks while an examination of aerial photographs was carried out in an effort to locate suitable damsites on Moose Jaw Creek. Survey ties were also made for approximately 55 bore holes at the Ridge and Squaw Creek sites while some 500 acres of large-scale topography was taken to facilitate a paper location of the canal between the intake site and the #2 pumping station. At the intake site itself soundings of the South Saskatchewan River were taken over an area approximately 1,000 feet square.

Location surveys were carried out for some 11.7 miles of canal between the intake and the Summit and as well 4.5 miles of location line were run from the Summit to the point where Ridge Creek joins the Qu'Appelle River.

During the year a contract was let for the excavation of 9.7 miles of canal from #2 pumping station to the Summit of the Qu'Appelle Valley. Started in mid-August this work was 75 per cent completed by the end of the fiscal year.





At the lower end of Eyebrow Lake the P.F.R.A. dredge excavated about one mile of pilot channel in the late fall. A hired dragline removed about 80,000 cubic yards of material from a two-mile length of the channel of the Qu'Appelle River immediately downstream from the east end of Eyebrow Lake starting at the lower end of the pilot channel excavated by the P.F.R.A. dredge. This work enabled about two and one-half feet of water to be drained off a portion of Eyebrow Lake. Approximately one mile of canal downstream from the Summit was also cleaned by hired dragline.

## MANITOBA PROJECTS

### RIDING-DUCK MOUNTAIN PROJECT

Under the terms of a joint agreement between the Government of Canada and the Province of Manitoba further work was carried out on this project during the year.

Field survey work commenced on May 10, and was still in progress at the end of the year. Most of this was carried out in the Mineral Creek area, southeast of the Village of Gilbert Plains and along the route of the proposed Scott Creek-Henderson Creek-Lake Dauphin Drain. Other minor surveys were conducted on Garland Creek and Fishing River.

No new construction was commenced on the project in 1954 but a number of improvement works were undertaken. In the spring approximately 60 acres of dike, berm and spoil dumps were seeded to a grass mixture. This was carried out along the Wilson River and Edwards, Mink, Brown's and Ranch Creeks.

The major improvement work required on the project was begun late in October and completed by mid-December. On Edwards Creek this consisted of building a small, dumped-rock weir approximately one hundred feet downstream of the #10 Highway Bridge. This structure is intended to prevent further bed cutting which had exposed the bridge footings and the town supply water main. Additional riprap was placed on the east bank of Edwards Creek above and below the #5 Highway Bridge. The upstream work starting about 600 feet from the highway, extends for 2,000 feet to tie in with riprap previously placed at the Jackfish Creek-Edwards Creek confluence. Additional rock was also placed on the small weir built in 1953 just below the highway bridge.

On the Wilson River two eroding banks were protected with rock riprap and similar additional work was necessary on a troublesome reach of the Mink Creek above and below the bridge on #10 Highway.

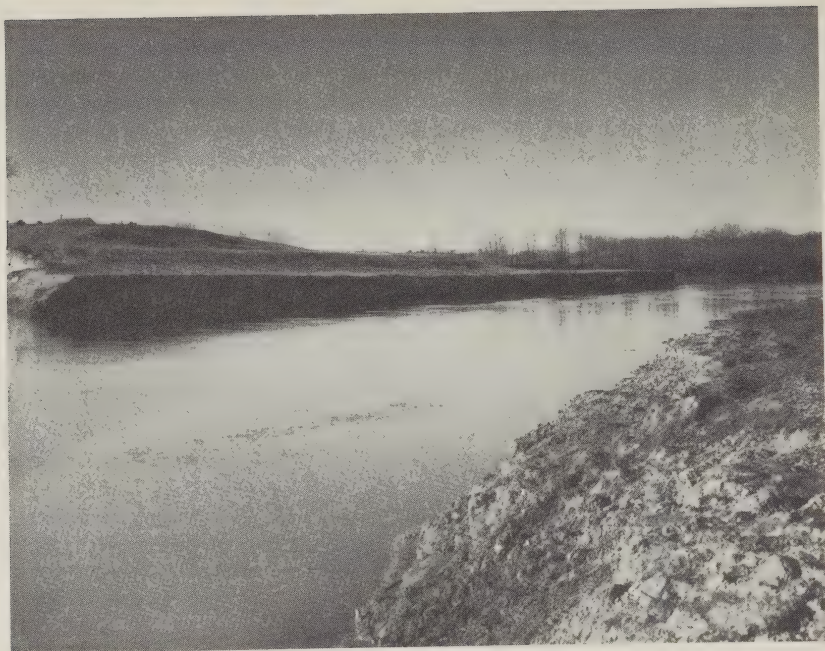


Fig. 39. Ref. 3649

Abrahams cut-off on the Assiniboine River, close to Portage la Prairie, Manitoba.

#### ASSINIBOINE RIVER DIKING

The diking system between Portage la Prairie and Winnipeg has been the responsibility of the P.F.R.A. since 1950. Since that time a total of 27 1/2 miles of new diking with a top width of 10 feet and side slopes of 2 1/2:1 has been constructed. Of the above total, 11 1/2 miles were constructed during 1954, representing approximately two-thirds of the contract completed. The remainder of the work, which had to be suspended on account of weather conditions, will be finished in 1955.

#### KENTON DIKE

During the flood of June and July much cultivated land in the Assiniboine River Valley between Kamsack, Saskatchewan and Brandon, Manitoba, was flooded. In some cases privately constructed dikes were overtopped and washed away. One such instance occurred on the north bank of the Assiniboine River about one mile downstream of Sproat's Bridge northeast of Virden.

As a result of this failure the river threatened to cut a new channel across cultivated land to the east. To rectify the situation P.F.R.A. constructed a 1,300-foot dike with an average height of 6.4 feet. This will be seeded to grass in 1955.

## SURVEYS

Survey work completed during 1954 included dike locations on the Portage la Prairie-Winnipeg reach of the Assiniboine River; the survey associated with the Kenton Dike, mentioned elsewhere; the tying in of high-water marks during the Assiniboine River flood; a location survey relating to the Hampson and Lewko dams on the LaSalle River and a survey of the channel of the Minnedosa River below the Minnedosa Dam.



APPENDIX I

Cumulative Statement

Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act

1938 to March 31, 1955

Fiscal Year	No. of Pasture Units in Op- eration	Area of Pastures in Op- eration (acres)	Total Cost of Construction of Pastures in Operation	Livestock Units Carried on Pas- ture	Acres per unit of live- stock	Cost of Operation		Net Oper- ating Cost per Unit of Livestock	Average Charge per Unit Livestock to Farmers \$
						Revenue	Operating Costs		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
						3,481,367.18	2,999,096.34		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.

- A pasture unit may include one or more pastures, but it is operated under one management.

## APPENDIX II

P. F. R. A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1954-55.

Community Pasture and Headquarters	Area of Pasture Fenced (acres)	Accumulated Cost of Construction Mar. 31/54	Accumulated Cost of Construction Mar. 31/55	1954-55 Stock Pastured Cattle Horses
Pasture Operating Units - Saskatchewan				
Coalfields #4, North Portal	24, 880	108, 156.55	109, 640.14	1,243 30
Estevan - Cambria #5-6, Macoun	6, 720	14, 246.95	14, 246.95	506 5
Masefield #17, Orkney	33, 280	83, 696.81	83, 696.81	1,234 12
Lone Tree #18, Bracken	32, 960	66, 893.88	70, 873.39	2,090 42
Battle Creek #20, Divide	66, 880	100, 978.12	108, 918.47	2,241 23
Nashlyn #21, Consul	61, 520	64, 654.31	68, 427.87	1,799 --
Govenlock #22, Govenlock	65, 120	81, 150.14	87, 835.91	2,320 10
Lomond #37, Pasture #1, Goodwater	23, 360	51, 047.33	55, 538.34	1,615 42
Lomond #37, Pasture #3, Maxim	18, 720	62, 043.41	65, 261.01	1,393 30
Laurier #38, Lomond #37 - #2, Radville	37, 120	69, 147.67	69, 147.67	2,849 101
The Gap #39, Hardy	12, 000	38, 955.62	38, 955.62	1,350 18
Val Marie #47, Val Marie	156, 160	219, 218.55	238, 843.87	5,713 12
Beaver Valley #47A, Beaver Valley	11, 360	23, 956.95	23, 956.95	639 --
Reno #51, Pasture #1, Robsart	16, 160	31, 822.33	52, 222.19	1,189 16
Reno #51, Pasture #2, Consul	10, 320	23, 784.94	26, 150.16	784 3
Tecumseh #65, Forget	18, 560	52, 854.37	56, 436.34	2,033 43
Brokenshell #68, Pasture #1, Yellow Grass	21, 120	39, 600.77	45, 379.85	1,445 46
Brokenshell #68, Pasture #2, Weyburn	8, 160	13, 583.47	13, 583.47	529 12
Excel - Key West #71-70, Kayville	31, 360	63, 335.44	69, 127.73	3,054 55
Auvergne - Wise Creek #76-77, Ponteix	40, 880	102, 227.44	111, 893.89	2,733 7
Wellington #97, Tyvan	25, 680	84, 711.62	87, 213.00	3,621 109
Caledonia - Elmsthorpe #99-100, Milestone	24, 320	97, 210.15	97, 951.87	1,754 54
Shamrock #134, Shamrock	26, 480	72, 024.08	72, 024.08	2,188 38
Swift Current - Webb #137-8, Beverley	18, 400	71, 592.16	75, 074.77	1,426 14
Gull Lake #139, Tompkins	10, 720	23, 691.23	28, 745.95	392 --
Big Stick #141, Maple Creek	18, 520	40, 751.77	40, 751.77	1,360 --
Bitter Lake #142, Maple Creek	34, 400	70, 123.29	90, 123.29	1,982 --
Spy Hill #152, Welby	20, 000	49, 268.07	50, 399.64	1,247 10
Elbow #223-4, Elbow	29, 440	69, 323.68	73, 867.31	2,091 77
Beaver Hills #245-6, Homefield P.O.	44, 160	103, 514.62	104, 892.59	3,075 199
Willner #253, Rosemae P.O.	12, 800	32, 278.10	49, 618.52	1,026 --
Coteau #255, Birsay	27, 200	54, 941.76	57, 249.23	1,554 27
Monet #257, Elrose	46, 520	98, 753.84	104, 877.62	2,448 49
Newcombe #260, Glidden	53, 280	119, 484.10	152, 897.03	2,479 50
Mantario #262, Empress, Alta.	24, 480	60, 292.62	63, 897.03	1,379 --

Community Pasture and Headquarters

Pasture Operating Units - Saskatchewan - cont'd.

	Area of Pasture Fenced (acres)	Accumulated Cost of Construc- tion Mar. 31/54	Accumulated Cost of Construc- tion Mar. 31/55	Stock Pastured Cattle Horses
Wreford #280, Hatfield	12,640	69,395.44	74,028.31	1,117 --
McCraney #282, Davidson	12,640	63,608.76	63,608.76	1,543 --
Rudy - Rosedale #284-3, Broderick	14,240	73,973.68	77,651.42	1,840 67
Hillsburgh #289, Brock	13,760	48,702.87	52,235.09	761 --
Eagle Lake #289 - 319, Netherhill	21,680	44,995.37	50,610.92	700 31
Kindersley - Elma #290-1, Smiley	24,000	105,247.09	110,303.62	1,888 75
Usborne #310, Venn	12,720	36,570.38	36,570.38	1,318 --
Dundurn #314, Dundurn	44,480	41,289.60	93,259.40	1,383 --
Montrose #315, Gledhow	20,480	48,836.11	49,769.60	1,050 --
Oakdale #320, Beaufield	33,940	60,346.58	60,346.58	740 35
Antelope Park #322, Hoosier	16,480	92,001.41	97,950.60	2,208 39
Wolverine #340, R.R.#1, Burr	27,020	60,761.52	64,552.43	1,425 --
Mariposa #350, Kerrobert	19,200	82,693.92	82,693.92	2,051 116
Progress #351, Kerrobert	15,000	59,021.39	59,021.39	1,490 --
Heart's Hill #352, Compeer, Alta.	7,040	28,094.31	28,105.07	1,477 7
Park #375, Langham	30,520	19,698.22	22,148.62	566 --
Battle River - Gutknife #438-9, Gallivan	64,960	72,576.30	79,198.56	1,214 53
Royal #465, Marcelin	23,200	146,204.30	149,745.77	1,710 --
Paynton #470, Paynton		67,074.23	70,337.11	1,364 49
Totals for Saskatchewan	1,537,520	3,580,407.41	3,881,857.88	90,426 1,606

Special Projects - Nashlyn Bull Station included in Nashlyn Pasture  
Bitter Lake Irrigation included in Bitter Lake Pasture

Pasture Operating Units - Manitoba

Archie Pasture, Welwyn	40,340	80,761.06	83,549.89	1,421 13
Ellice Pasture, Welby	20,320	27,614.80	28,746.37	1,247 11
Portage Pasture, Poplar Point	14,640	39,347.92	43,026.86	2,686 105
Woodlands Pasture, Poplar Point	20,960	61,745.25	62,732.66	2,245 145
Lakeview Pasture, Langruth	29,280	77,337.63	77,337.63	2,975 26
Westbourne Pasture, Gladstone	11,520	36,566.33	36,566.33	1,392 23
Langford Pasture, Neepawa	19,040	59,792.43	60,099.17	1,898 34
Wallace Pasture, Elkhorn	3,280	(Operated by R. M. Wallace)		
Totals for Manitoba	159,380	383,165.42	392,058.91	13,934 357
Grand Totals	1,696,900	3,963,572.83	4,273,916.79	104,360 1,963

# APPENDIX III

## PRAIRIE FARM REHABILITATION ACT

showing number of projects and amount of financial assistance paid since the inauguration of program to March 31, 1955

Province & Classification	DUGOUTS		STOCKWATERING DAMS		IRRIGATION SCHEMES		TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
<b>MANITOBA</b>								
Individual	10,401	1,026,706.31	307	22,677.26	114	34,663.99	10,822	1,084,047.56
Neigh. & Comm.	46	9,045.79	26	20,449.43	4	1,060.15	76	30,555.37
Total	10,447	1,035,752.10	333	43,126.69	118	35,724.14	10,898	1,114,602.93
<b>SASKATCHEWAN</b>								
Individual	27,848	3,093,141.69	3,924	334,494.32	1,930	445,902.97	33,702	3,873,538.98
Neigh. & Comm.	424	177,912.64	142	99,113.19	71	29,666.45	637	306,692.28
Total	28,272	3,271,054.33	4,066	433,607.51	2,001	475,569.42	34,339	4,180,231.26
<b>ALBERTA</b>								
Individual	3,507	366,752.59	1,982	184,953.61	876	205,671.91	6,365	757,378.11
Neigh. & Comm.	30	9,229.34	42	27,018.37	17	12,402.30	89	48,650.01
Total	3,537	375,981.93	2,024	211,971.98	893	218,074.21	6,454	806,028.12
<b>GRAND TOTAL</b>								
	42,256	4,682,788.36	6,423	688,706.18	3,012	729,367.77	51,691	6,100,862.31



APPENDIX IV

Progress by Years in the Construction of Small Projects

P. F. R. A. Water Development Program  
1935 to March 31, 1955

Fiscal Year	Number of Projects Constructed				Financial Assistance Paid on Projects			
	(1) DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,945	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	1,804	194	48	5,187	581,172.05	19,549.87	8,697.00	609,419.74
1947-48	1,505	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	3,020	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,432	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	473	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	861	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08
1952-53	1,774	119	288	1,268	100,219.54	13,382.92	92,397.46	205,999.92
1953-54	1,774	178	181	2,133	204,148.93	18,373.83	46,550.99	269,073.75
1954-55	1,284	227	175	1,686	147,264.01	24,064.21	43,094.67	214,422.89
TOTAL	42,256	6,423	3,012	51,691	4,682,788.36	688,706.18	729,367.77	6,100,862.31

IRR - Individual Irrigation Project

SWD - Stockwatering Dam

(1) DO - Dugout

## WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS

To March 31, 1955

## MANITOBA

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Crystal City Storage	1	Crystal City	Stockwatering	1935	---	3	3,334.00
Edwards R. M. of Town of Souris	2	Melita	"	1935	---	100	10,214.00
	3	Souris	"	1935	---	150	3,841.00
Clear Water Storage	4	Clear Water	"	1938	---	12	5,949.00
Brandon Water Supply	5	Brandon	Storage	1940	---	500	3,996.00
Morris River-Rock Lake	6	Carman	Stockwatering	1940	---	10,000	23,401.00
Dead Horse Creek Dam	7	Morden	Irr. & Stockwatering	1941	100	1,200	49,891.00
LaSalle River Dams	8	LaSalle	Stockwatering	1941	---	900	22,989.00
Hartney	9	Hartney	Irr. & Stockwatering	1941)	---		(10,264.00
Melita	10	Melita	"	1941)	3,900	3,200	(11,372.00
Napinka	11	Napinka	"	1941)			( 6,770.00
Wawanesa	12	Wawanesa	"	1941)			15,457.00
Whitemud River Storage	13	Gladstone	Stockwatering	1943	---	660	11,464.00
Alexander Soil Conservation	14	Alexander	Soil Conservation	1944	---	---	5,250.00
Little Souris River Dam	15	Melita	Stockwatering	1945	---	250	1,380.00
Birtle Dam	16	Birtle	Stockwatering	1947	---	---	11,490.00
Westbourne R. M. of	17	Gladstone	"	1947	---	---	5,993.00
Rosebank Dam	18	Rosebank	Stockwatering	1948	---	32	12,161.00
Shoal Lake Project	19	Shoal Lake	"	1948	---	3,500	8,491.00
St. Lazare Storage Res.	20	Lazare	"	1948	---	5	1,470.00
Brandon Flood Irr.	21	Brandon	Flood Irrigation	1949	1,000	---	27,107.00
Whitemud River	22	Woodside	Stockwatering	1949	---	160	6,506.00

<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Dead Lake Community Minnedosa Dam	23 24	Gladstone Minnedosa	Irr. & Stockwatering Storage	1950 1950	20 20	90 1,500	1,933.00 105,051.00
Wawanesa	12	Wawanesa	Irr. & Stockwatering	1952	---	---	109,875.00
Town of Souris	3	Souris	Stockwatering	1953	---	---	72,996.00
Dead Horse Creek	7	Morden	Irr. & Stockwatering	1953	---	---	294,356.00
Hogue Dam	8	Sanford	Stockwatering	1953	---	---	29,183.00
Park Lake	25	Neepawa	"	1953	---	---	21,626.00
Deloraine	26	Deloraine	"	1953	---	1.5	770.00
Waskada	27	Waskada	"	1953	---	1.5	853.00
Boissevain	28	Boissevain	Storage	1954	---	580	29,992.00
Lewko Dam	29	Sanford	"	1954	---	320	20,874.00
Hampson Dam	30	Sanford	"	1954	---	420	16,899.00
Oak Lake			Irrigation	Incomplete	13,000		2,430.00
						<u>23,585</u>	

SASKATCHEWAN

Adams Lake	1	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
Lajord	2	Lajord	Flood Control	1936	---	300	13,800.00
Val Marie	3	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Middle Creek	4	Battle Creek	"	1937	1,000	20,000	18,663.00
Davidson	5	Davidson	Irr. & Stockwatering	1937	100	277	3,114.00
Dunn & Watt	6	Mankota	Irrigation	1937	305	---	2,996.00
Moose Mountain	7	Corning	"	1937	---	8,000	14,829.00
Girvin	8	Girvin	Stockwatering	1937	---	19	2,180.00
Lac Pelletier	9	Lac Pelletier	"	1937	---	3,350	2,139.00
McGrancy, R. M., of	10	Kenaston	"	1937	---	350	1,896.00
Roughbark Creek	11	Goodwater	"	1937	---	1,500	9,314.00
Maple Creek	12	Maple Creek	Irr. & Stockwatering	1938	10,000	23,260	356,179.00
Moose Jaw Creek	13	Lang	Irrigation	1938	2,250	2,180	7,618.00
Lake of the Rivers	14	Assiniboia	Stockwatering	1938	---	300	10,805.00
Long Creek #1	15	Estevan	"	1938	---	137	8,729.00
Long Creek #2	16	Estevan	"	1938	---	90	8,701.00
Masefield	17	Masefield	"	1938	---	40	3,187.00
Pipestone Lake	18	Broadview	"	1938	---	1,600	11,785.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Eastend	19	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Cypress Storage	20	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
Big Arm Storage	21	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Kibbey Flats	22	Kibbey	Irrigation	1939	2,300	5,000	23,211.00
Arcola	23	Arcola	Stockwatering	1939	---	Under-	17,310.00
						Ground	
Val Marie West	24	Val Marie	Irrigation	1940	4,230	2,000	150,639.00
LaFleche	25	LaFleche	Stockwatering	1940	---	38	2,525.00
Saskatoon	26	Saskatoon	Storage	1940	---	1,200	290,446.00
Weyburn	27	Weyburn	Flood Irrigation	1940	---	4,000	51,311.00
Buffalo Pound	28	Qu'Appelle Valley	Irrigation	1940	*	---	83,723.00
Battleford	29	North Battleford	Irrigation (Pump)	1941	800	---	3,058.00
Dead Lake	30	Macoun	Irr. & Stockwatering	1941	Souris River Development	---	( 17,528.00
Oxbow	31	Oxbow	"	1941	3,900	3,200	( 17,436.00
Souris-Estevan	32	Estevan	"	1941	---	---	( 91,133.00
Canora	33	Canora	Storage	1941	---	300	16,128.00
Crooked & Round Lake	34	Qu'Appelle Valley	Irrigation & Water Control	1941	*	---	48,650.00
Fairhill	35	Qu'Appelle Valley	"	1941	*	---	4,302.00
Lebret	36	Qu'Appelle Valley	"	1941	*	---	16,307.00
Last Mountain Lake	37	Qu'Appelle Valley	"	1941	*	---	42,271.00
Tantallon	38	Tantallon	Stockwatering	1942	---	---	2,790.00
Wood River Development	39	Coderre and Gravelbourg	"	1942	---	4,923	33,738.00
Jackfish Creek	40	Meota	Stockwatering	1943	---	90	2,940.00
Craven Dam	41	Qu'Appelle Valley	Irrigation	1943	*	---	33,675.00
Echo Lake	42	Qu'Appelle Valley	"	1943	*	---	41,753.00
Caron Water Development	43	Thunder Creek	Stor. & Stockwatering	1944	---	43,500	701,433.00
Cadillac	44	Cadillac	Irr. & Stockwatering	1945	800	1,350	32,887.00
Wolverine Creek	45	Humboldt	Stockwatering	1945	---	522	52,600.00
Look Creek	46	Markinch	"	1945	---	700	7,180.00

\* - Ultimate irrigation development for all projects along Qu'Appelle River Valley - 30,000 (Total storage capacity - 95,600 acre feet.)



Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Costs	
						Store Cap. Acre Feet	
Richardson - McKinnon	47	Consul	Irrigation	1946	3,000	---	53,913.00
Swift Current	48	Swift Current	Irr. & Stockwatering	1946	30,000	95,000	816,472.00
Beechy #1	49	Beechy	"	1946	600	1,000	12,746.00
Matador	50	Matador	"	1946	120	220	5,216.00
Bracken	51	Bracken	Stockwatering	1946	---	158	1,001.00
Eagle Hill Creek	52	Plenty	"	1946	---	10,700	6,432.00
Hanley	53	Hanley	"	1946	60	---	3,797.00
Lucky Lake	54	Lucky Lake	"	1946	---	120	7,596.00
Frenchville	55	Frenchville	Irr. & Stockwatering	1947	430	670	8,096.00
Gravelbourg Storage	56	Gravelbourg	Irrigation	1947	500	---	1,917.00
Coronach	57	Coronach	Irr. & Stockwatering	1947	300	1,450	97,807.00
Wittrock	58	Frenchville	Irrigation	1947	520	---	3,884.00
Cedoux	59	Cedoux	Stockwatering	1947	---	314	4,999.00
Davin	60	Kronau	"	1947	---	1,080	13,501.00
Jumping Deer Creek	61	Lipton	"	1947	---	145	6,092.00
Kaposvar	62	Stockholm	"	1947	---	290	11,946.00
Kelfield	63	Kelfield	"	1947	---	25	4,927.00
Radville	64	Radville	"	1947	---	32	5,019.00
Shrimp Lake	65	Herschel	"	1947	---	450	9,367.00
Tyvan	66	Tyvan	"	1947	---	1,000	11,986.00
Wynyard	67	Wynyard	"	1947	---	35	6,225.00
Spangler Project	68	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Gravelbourg South	69	Gravelbourg	"	1948	600	1,500	8,186.00
Beechy #2	70	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
March Flood Irrigation	71	Cedoux	Irrigation	1948	400	---	1,765.00
Pike Lake	72	Vanscoy	Irr. & Stockwatering	1948	900	2,500	7,360.00
Rosedale	73	Hanley	Irrigation	1948	60	100	1,016.00
Sherwood	74	Regina	Dugout (Irrigation)	1948	20	3	697.00
Tallmage	75	Cedoux	Irrigation	1948	1,600	---	3,483.00
Allan	76	Allan	Stockwatering	1948	---	300	4,477.00
Boharm	77	Boharm	"	1948	---	100	6,250.00
Balcarres	78	Balcarres	"	1948	---	340	7,203.00
Cabri	79	Cabri	"	1948	---	100	37,553.00
Gooseberry Lake	80	Corning	"	1948	---	2,500	8,783.00

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Acre Feet	Costs
81	Glenside	Glenside	Stockwatering	1948	---	150	3,286.00
82	Mine Coulee	Neptune	"	1948	---	40	4,377.00
83	North Qu'Appelle	Fort Qu'Appelle	"	1948	---	100	2,386.00
84	Pasqua	Moose Jaw	"	1948	---	40	3,777.00
85	Stephens	Abernethy	"	1948	---	12	8,716.00
86	Wolseley	Wolseley	"	1948	---	20	1,800.00
87	Young	Young	"	1948	---	250	8,892.00
88	Caron	Caron	Storage	1948	---	100	17,109.00
89	Thunder Creek	Kettlehut	Flood Irrigation	1948	---	---	27,204.00
90	Souris River	Weyburn	Flood Control	1948	---	---	11,998.00
91	Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
92	Bateman	Gravelbourg	"	1949	400	114	4,739.00
93	Summercove	Mankota	"	1949	1,200	1,500	23,837.00
94	Scotsguard	Scotsguard	"	1949	2,000	3,000	1,962.00
95	Woodrow-Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
96	Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
97	Dummer	Milestone	"	1949	500	200	4,742.00
98	Eagle Lake	Coleville	"	1949	2,000	3,000	1,920.00
99	Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
100	Langenburg	Langenburg	Irr. & Stockwatering	1949	800	200	11,752.00
101	Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771.00
102	Muenster	Muenster	"	1949	25	11	2,754.00
103	McIntosh Slough	Golden Prairie	"	1949	500	1,500	1,990.00
104	Richman Irrigation	Glen Bain	"	1949	---	1,000	4,607.00
105	Reciprocity	Glen Ewen	Irr. & Stockwatering	1949	2,000	1,750	27,410.00
106	Summit Creek	Bridgeford	"	1949	800	3,000	13,227.00
107	Sauder	Rush Lake	Storage - Irrigation	1949	---	800	29,115.00
108	Shaben	Rush Lake	"	1949	---	300	9,028.00
109	Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	---	8,133.00
110	West Osage	Cedoux	Irr. & Stockwatering	1949	300	600	4,905.00
111	Beadle	Beadle	Stockwatering	1949	---	2	997.00
112	Brock Community	Brock	"	1949	---	2	951.00
113	Caron Community Dam	Caron	"	1949	---	4	697.00
114	Cactus Lake	Cactus Lake	"	1949	---	2	730.00
115	Chapleau Lake	Montmartre	"	1949	---	3,530	8,208.00
116	Dry Lake	Forward	"	1949	---	600	9,729.00
117	Eastview	Pense	"	1949	---	200	5,970.00
118	Edenwold	Balgonie	"	1949	---	400	15,599.00
119	Elfros	Elfros	"	1949	---	25	7,321.00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Eatonia	120	Eatonia	Stockwatering	1949	---	12	1,199.00
Hodgeville	121	Hodgeville	"	1949	---	5	2,748.00
Kindersley	122	Kindersley	"	1949	---	300	2,007.00
Kincaid	123	Kincaid	"	1949	---	10	2,539.00
Maxim Lake	124	Maxim	"	1949	---	5,000	20,472.00
Meeting Lake	125	Redfield	"	1949	---	100	2,683.00
Monet	126	Hughton	"	1949	---	10	878.00
Mossbank	127	Mossbank	"	1949	---	2	875.00
Mennon	128	Waldheim	"	1949	---	2	976.00
Prairiedale	129	Superb	"	1949	---	2	987.00
Snipe Lake	130	Eston	"	1949	---	---	3,415.00
Sioux Reserve	131	Fort Qu'Appelle	"	1949	---	75	8,605.00
Truax Dam	132	Truax	"	1949	---	250	11,899.00
Camberly	133	Camberly	Irr. & Stockwatering	1950	---	100	2,106.00
Poplar River	134	Coronach	"	1950	300	900	14,838.00
Baldon & Tilney	135	Baldon	Stockwatering	1950	---	4	780.00
Cutknife	136	Cutknife	"	1950	---	5	280.00
Crane Valley	137	Viceroy	"	1950	---	2	599.00
Delisle	138	Delisle	"	1950	---	45	4,899.00
East Borden	139	Borden	"	1950	---	60	526.00
Elrose	140	Elrose	"	1950	---	5	999.00
Fleming	141	Moosomin	"	1950	---	75	3,282.00
Fielding	142	Maymont	"	1950	---	50	918.00
Hague Dugout	143	Hague	"	1950	---	2	1,000.00
Stewart Valley Dugout	144	Stewart Valley	"	1950	---	3	799.00
Sturgis Community Dam	145	Sturgis	"	1950	---	60	20,961.00
Viceroy	146	Viceroy	"	1950	---	3	798.00
Readlyn	147	Readlyn	"	1950	---	3	800.00
Round Hill Water Users	148	North Battleford	Irr. & Stockwatering	1950	425	50	4,791.00
Melavel	149	Melavel	Stockwatering	1950	---	18	1,200.00
Mankota Dam	150	Mankota	"	1950	---	10	950.00
McDonald Creek	151	McCord	Irr. & Stockwatering	1950	400	90	4,992.00
Tribune Dam	152	Tribune	Stockwatering	1950	---	300	6,499.00
Bright Water Creek	153	Hanley	Irrigation	1950	2,500	3,500	858.00
Consul-Vidora	154	Vidora	"	1950	3,000	---	62,500.00
Alicane	155	Richard	Stockwatering	1951	---	2.5	858.00
Beaver Creek	156	Hanley	"	1951	---	200	7,998.00

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
157	Clearfield	Goodwater	Irr. & Stockwatering	1951	70	300	5,999.00
158	Dalmeny	Dalmeny	Stockwatering	1951	---	3	1,000.00
159	Denzil	Macklin	Stockwatering	1951	---	2	975.00
160	Dunning	Radville	Irrigation	1951	120	200	3,566.00
161	Reford	Wikie	Stockwatering	1951	---	160	1,814.00
162	Reward	Reward	"	1951	---	---	921.00
163	Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
164	Salvador	Reward	Stockwatering	1951	---	5	1,000.00
165	Smiley	Smiley	Irr. & Stockwatering	1951	600	300	9,998.00
166	Thunder Creek Channel	Moose Jaw	"	1951	300	7,000	10,007.00
167	Wheatlands, R. M. of	Parkbeg	"	1951	100	60	3,452.00
168	Wood Mountain	Willowbunch	"	1951	40	60	6,337.00
169	Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
170	Newburn Lake	Invermay	Irr. & Stockwatering	1952	50	1,280	6,477.00
171	Terrell, R. M. of	Spring Valley	Stockwatering	1952	---	10	2,491.00
172	Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
98	Eagle Lake	Coleville	Irr. & Stockwatering	1952	2,000	3,000	4,078.00
173	Gibson Flats	Pennant	Irrigation	1953	1,200	---	14,177.00
174	Artland Grazing	Marsden	Dugout (Stockwatering)	1953	---	1.5	933.00
175	Balcarras Storage	Balcarras	Dam (Storage)	1953	---	20	10,294.00
176	East Manitou	Neilburg	Dugout (Stockwatering)	1953	---	1.5	789.00
177	Gordon Grazing	Chauvin	"	1953	---	1.5	830.00
178	Little Manitou	Senlac	"	1953	---	1.5	862.00
179	Lancer Water Users	Lancer	Irrigation	1953	1,265	---	35,000.00
180	Laird, R. M. of	Waldheim	Dugout (Stockwatering)	1953	---	1.5	999.00
181	Meota, R. M. of	Meota	"	1953	---	1.5	1,000.00
182	Manitou Cattle Co-op	Chauvin	"	1953	---	1.5	861.00
183	North Battleford, City of	North Battleford	"	1953	---	1.5	970.00
184	Rosemount Co-op	Landis	"	1953	---	1.5	903.00
185	Vera Grazing	Vera	"	1953	---	1.5	891.00
186	Glasnevin	Glasnevin	"	1953	---	1.5	554.00
187	Pheasant Creek	Lemberg	Storage	1954	---	500	114,464.00
188	Kaposvar Creek	Melville	Stockwatering	1954	---	1,400	102,747.00
189	Moosomin Dam	Moosomin	Storage	1954	---	9,000	389,432.00
190	Fife Lake Restoration	Constance	Stockwatering & Irr.	1954	1,200	---	9,596.00
191	Fife Lake #2	Constance	Stockwatering & Irr.	1954	650	---	6,348.00
192	Rock Glen Grazing	Rock Glen	"	1954	600	300	6,010.00
193	Village of Conquest	Conquest	Dugout (Stockwatering)	1954	---	1.5	1,000.00



Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Snakebite	194	Beechy	Irrigation	1954	665	---	9,999.00
Town of Eston	195	Eston	Stockwatering	1954	---	10	11,469.00
Vera Winter Grazing	196	Vera	Dugout (Stockwatering)	1954	---	1.5	820.00
Alpine	197	Senlac	"	1954	---	1.5	794.00
Airedale	198	Senlac	"	1954	---	1.5	769.00
Lodge Lake	199	Evesham	"	1954	---	1.5	880.00
Meadowland	200	Macklin	Irrigation	1954	500	---	6,370.00
North End Grazing	201	Macklin	Dugout (Stockwatering)	1954	---	1.5	728.00
Snowdown	202	Fox Valley	"	1954	---	1.5	898.00
Lacadena	203	Snowdown	Irrigation	1954	---	---	9,678.00
Yonker	204	Chauvin	Dugout (Stockwatering)	1954	---	1.5	718.00
Ceylon Reservoir		Ceylon	Irr. & Stockwatering	Incomplete	300	250	6,396.00
Doonside Dam		Wawota	Irrigation	"	1,500	1,500	1,307.00
Elfros		Foam Lake	Stockwatering	"	---	900	1,990.00
Macklin Storage		Macklin	"	"	---	40	967.00
North Herbert Extension		Herbert	"	"	---	---	511,909.00
West Poplar #1		Killdeer	Irrigation	"	750	1,000	4,460.00
Montague Lake		Assiniboia	"	"	235	---	1,000.00
Langenburg		Langenburg	"	"	---	2.5	3,000.00
						431.157	
ALBERTA							
Canada Land & Irrigation Project	*1	Medicine Hat	Irrigation	1936	45,000	---	80,000.00
Mountain View	2	Mountain View	Storage	1936	---	4,200	3,000.00
Wildhorse Storage	3	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Eastern Irr. District	*4	Brooks	Irrigation	1937	2,280	22,000	22,490.00
Rolling Hills	*5	Rolling Hills	Irrigation	1938	25,000	---	46,839.00
Magrath	*6	Magrath	Irrigation	1939	4,955	---	2,756.00
Leavitt Irrigation	*7	Mountain	"	1939	7,000	7,050	65,578.00
Atlee Gas Well #1	8	Atlee	" (Pump)	1939	7,000	---	12,423.00
Atlee Gas Well #2	8A	Atlee	" (Pump)	1939	---	---	14,300.00
Bull Pound Creek	9	Hanna	Stockwatering	1939	---	2,000	---

Ref. No.	Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor., Cap. Acre Feet	Costs
10	Bullshead Creek	Medicine Hat	Irr. & Stockwatering	1940	800	1, 130	8, 170. 00
*11	Raymond	Raymond	Irrigation	1943	3, 000	1, 600	6, 000. 00
12	Bartman Dam	Cessford	Irr. & Stockwatering	1943	1, 000	3, 000	49, 100. 00
13	Graham Creek	Calgary	Stockwatering	1943	---	230	8, 529. 00
14	Seven Persons	Seven Persons	"	1943	---	800	12, 103. 00
* - P. F. R. A. gave assistance to a project already in existence, to improve storage capacities, canals and distribution systems.							
15	Aetna Irr. District	Aetna	Irrigation	1947	8, 000	---	82, 004. 00
16	Pothole Coulee	Magrath	Irrigation	1948	(Part of St. Mary Project)		
17	Berry Creek	Carolside	"	1948	10, 000	30, 000	158, 884. 00
18	North Fincastle	Taber	Irr. & Stockwatering	1948	2, 000	4, 000	17, 943. 00
19	South Macleod	Macleod	Irrigation	1948	6, 000	---	82, 614. 00
20	Badger Lake	Lomond	Stockwatering	1948	---	10	2, 990. 00
21	Clear Lake	High River	"	1948	---	10, 000	35, 000. 00
22	Franklin Coulee	Retlaw	"	1948	---	1, 500	20, 125. 00
23	Hanna	Hanna	"	1948	---	500	29, 498. 00
24	Three Hills	Three Hills	"	1948	---	120	19, 652. 00
25	Vauxhall	Vauxhall	"	1948	---	30	5, 883. 00
26	Bell Lake	Pollockville	Irrigation	1949	700	1, 500	4, 738. 00
27	Brunswick Coulee	Enchant	"	1949	500	205	4, 631. 00
28	Dead Fish Creek	Cessford	"	1949	4, 000	5, 000	47, 832. 00
29	Eureka Irrigation Project	Grassy Lake	"	1949	12, 000	1, 000	38, 568. 00
30	East Berry Creek	Rose Lynn	"	1949	1, 500	750	9, 677. 00
31	Sounding Creek	Cereal	"	1949	8, 000	5, 600	51, 988. 00
32	Squaw Coulee	High River	"	1949	2, 000	455	17, 999. 00
33	Serviceberry Creek	Near Drumheller	"	1949	1, 200	500	17, 518. 00
34	Argyle, M. D. of	Stavely	Stockwatering	1949	---	80	10, 912. 00
35	C. Y. Water Users	Taber	"	1949	---	310	16, 477. 00
36	Snake Creek	Calgary	Irr. & Stockwatering	1950	500	300	15, 976. 00
37	Seyvern Creek	Rosebud	"	1950	1, 000	1, 000	24, 990. 00
38	Bare Creek	Comrey	"	1950	---	500	11, 600. 00
39	Ross Creek	Irvine	Irrigation	1950	3, 000	5, 000	47, 998. 00
40	Wheatacre Dam	Rockyford	"	1950	1, 600	1, 500	12, 976. 00
41	Wintering Hills	Hussar	"	1950	1, 000	500	9, 993. 00

Name of Project	Ref. No.	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Beaverdam Creek Reservoir	42	Castor	Stockwatering	1950	---	300	17,996.00
Ross Lake Comm.	43	Raymond	"	1950	---	300	7,987.00
Lake Beauvais	44	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Loyalist Creek	45	Hanna	"	1950	2,000	1,400	14,993.00
Irvine	46	Irvine	Irr. & Stockwatering	1950	70	100	4,799.00
Ambrose Flats	47	Irvine	Irrigation	1951	800	1,000	4,781.00
McAlpine Reservoir	48	Walsh	"	1951	600	1,000	15,917.00
McGregor Dam	49	Vulcan	"	1951	1,500	700	9,473.00
Pirmez Creek	50	Pirmez Creek	"	1951	6,000	500	20,998.00
Pershing Dam	51	Glenwood	"	1951	100	200	4,782.00
Vulcan Dam	52	Vulcan	"	1951	400	150	3,997.00
Reid Hill	53	Vulcan	Irrigation	1952	1,000	700	8,866.00
Wheatacre #2	54	Rockyford	"	1952	---	---	4,744.00
Esther Flood Irrigation	55	Macklin	"	1952	4,000	5,000	4,592.00
MacKay Dam	56	Walsh	"	1952	600	300	9,600.00
Meadow Creek Dam	57	Clareholm	"	1952	1,500	---	5,630.00
Cowley Community	58	Cowley	"	1952	750	---	4,666.00
Acadia Valley	59	Acadia Valley	Dugout (Stockwatering)	1953	---	1.5	2,252.00
Anatoie	60	Hanna	Stockwatering	1953	---	7	2,990.00
Bowmanton	61	Bowmanton	"	1953	---	500	14,860.00
Comrey Grazing	62	Comrey	Dugout (Stockwatering)	1953	---	1.5	1,000.00
Drowning Ford	63	Vale	Stockwatering Dam and two Dugouts	1953	---	100	4,368.00
Indian Farm Creek	64	Pincher Creek	Irr. & Stockwatering	1953	600	500	4,795.00
Lundbreck	65	Pincher Creek	Stockwatering	1953	---	100	4,689.00
Lewis	66	Vulcan	Irr. & Stockwatering	1953	350	---	4,345.00
Nobleford Water Users	67	Nobleford	Two Dugouts (Stockwatering & Canal)	1953	---	3	11,173.00
Sheerness Grazing (Blois)	68	Roselynn	Stockwatering	1953	---	12	3,797.00
Twin River Grazing	69	Twin River	"	1953	---	125	4,486.00
Walsh Flats	70	Walsh	Irrigation	1953	2,100	25,000	4,700.00
Yeast Reservoir	71	Thelma	"	1953	400	800	6,592.00

<u>Name of Project</u>	<u>Ref. No.</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
Acadia Valley #2	72	Acadia Valley	Dugout (Stockwatering)	1954	---	1.5	1,000.00
Comrey #2	73	Comrey	"	1954	---	1.5	980.00
Greasewood Coulee	74	Manyberries	Stockwatering & Irr.	1954	500	650	9,798.00
Bowell	75	Bowell	Dugout (Stockwatering)	1954	---	1.5	1,000.00
Nemiscam	76	Etzikom	"	1954	---	1.5	1,000.00
Illingsworth	77	Bow Island	"	1954	---	1.5	1,000.00
Bow Island 40 miles grazing	78	Bow Island	"	1954	---	1.5	782.00
Sheerness #2	79	Rose Lynn	Stockwatering	1954	---	50	2,190.00
Loveland	80	Hanna	Irrigation	1954	3,000	---	17,655.00
Parfiles	81	Hanna	Stockwatering	1954	---	17	2,808.00
Twin Lakes	82	Chancellor	Irrigation	1954	250	---	4,730.00
Commodore	83	Chancellor	"	1954	500	---	12,498.00
Champion	84	Vulcan	"	1954	400	---	3,990.00
Kathryn	85	Champion	"	1954	2,500	---	4,984.00
Conrich	86	Calgary	Stockwatering & Irr.	1954	300	---	9,184.00
Ruks	87	W. Calgary	Irrigation	1954	1,600	---	6,240.00
Fish Lake	88	Pincher Creek	Stockwatering & Irr.	1954	900	250	6,484.00
Cressday	89	Pincher Creek	"	1954	1,000	---	6,895.00
	90	Medicine Hat	Stockwatering	1954	---	---	13,541.00
Rough Meadow Reservoir		Coronation	Irrigation	Incomplete	200	---	2,471.00
Bedford Slough			Irrigation	"	3,000	200	13,335.00
						<u>159,246</u>	
Grand Total						<u>613,988</u>	



# APPENDIX VI

## MAJOR PROJECTS - IRRIGATION RECLAMATION

(Projects by Special Votes of Parliament, Administered by P. F. R. A.)

To March 31, 1955

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
<u>MANITOBA</u>						
Assiniboine River Dyking & Cut-off	Brandon	River Control	Incomplete	---	---	220, 940
Riding Mountain	Dauphin	Watershed Control	Incomplete	---	---	608, 732
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135, 000	---	930, 618
<u>ALBERTA</u>						
Bow River	Medicine Hat	Irrigation	Incomplete	235, 000	408, 862	54, 398
(a) Purchase of Canada Land & Irrigation Company	"					2, 353, 182
(b) Development & Construction						15, 997, 454
St. Mary	Lethbridge	Irrigation	Incomplete	519, 000	320, 000	9, 018, 473
Belly River Diversion	Lethbridge	Irrigation	1950	---	---	53, 901
<u>BRITISH COLUMBIA</u>						
Cawston Benches	Keremeos	Irrigation (Pump)	1951	629	2, 000	185, 491
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	---	98, 243
Western Canada Ranching #2	Kamloops	Irrigation (Pump)	1950	54	---	58, 069
Lillooet-Pemberton	Pemberton	River Control	1953	---	---	1, 056, 539
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1, 030	1, 200	12, 282
Westbank Project	Kelowna	Irrigation	1950	1, 200	2, 500	537, 450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	---	32, 229
Penticton West Bench	Penticton	Irrigation (Pump)	1953	800	---	66, 362

(Above includes only Construction Costs)

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# APPENDIX VII

## PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

April 1, 1935 - March 31, 1955.

	1935 - 1954	1954 - 1955	Total
<b>ADMINISTRATION</b>			
Ottawa Administration	224, 587	21, 553	246, 140
Regina Administration	977, 208	101, 045	1, 078, 253
Total	1, 201, 795	122, 598	1, 324, 393
<b>EQUIPMENT</b>			
Purchase of Equipment	709, 522	189, 453	898, 975
Upkeep of Equipment	501, 474	113, 857	615, 331
Equipment Depot	1, 096, 193	247, 120	1, 343, 313
Total	2, 307, 189	550, 430	2, 857, 619
<b>LAND UTILIZATION</b>			
Supervision	507, 641	43, 300	550, 941
Construction of Community Pastures	5, 270, 575	416, 387	5, 686, 962
Pasture Improvements	66, 111	26, 622	92, 733
Operation of Community Pastures	2, 807, 551	506, 382	3, 313, 933
Purchase of Bulls	438, 744	29, 428	468, 172
Re-establishment of Farmers	---	---	---
Grass Seeding & Experimental Regrassing	557, 664	67, 964	625, 628
Total	9, 648, 286	1, 090, 083	10, 738, 369
<b>WATER DEVELOPMENT</b>			
Supervision	712, 758	24, 177	736, 935
Small Projects including Engineering	12, 920, 268	1, 041, 674	13, 961, 942
Large Irrigation and Storage Projects			
Supervision	1, 614, 215	53, 292	1, 667, 507
Construction and Improvements	6, 369, 696	501, 869	6, 871, 565
Maintenance and Operation	4, 647, 219	422, 615	5, 069, 834
Re-establishment of Farmers	191, 148	4, 872	196, 020
Survey and Explorations	1, 660, 484	---	1, 660, 484
Purchase of Land	697, 736	11, 330	709, 066
Total	28, 813, 524	2, 059, 829	30, 873, 353
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service.)			
	4, 966, 394	---	4, 966, 394
GRAND TOTAL	46, 937, 188	3, 822, 940	50, 760, 128

SPECIAL VOTES UNDER P. F. R. A. ADMINISTRATION

	1935 - 1954	1954 - 1955	Total
Assiniboine River, Surveys and Construction	218, 390	69, 154	287, 544
Lillooet Project B. C. Construction & Exploration	1, 187, 415	5, 690	1, 170, 133
Land Reclamation & Development in B. C.	(j) 1, 673, 057	116, 094	1, 812, 123
St. Mary's Irrigation Project - Alberta	(i) 13, 349, 244	840, 913	14, 190, 157
Bow River Project - Alberta	16, 662, 659	3, 848, 616	20, 511, 275
Red Deer River Project - Alberta	744, 301	40, 979	785, 280
Other Miscellaneous Projects - Construction	210, 392	---	210, 392
Land Protection & Reclamation - Manitoba	1, 116, 556	423, 302	1, 559, 858
South Saskatchewan River Project - Saskatchewan	(g) 3, 127, 024	396, 008	3, 523, 032
Buffalo Pound Project - Saskatchewan	59, 584	172, 459	232, 043
Surveys and Engineering Costs	(l) 4, 256, 816	1, 331, 525	5, 588, 341
GRAND TOTAL	42, 605, 438	7, 244, 740	49, 850, 178

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388, 923. 57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95, 198. 65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300, 879. 29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147, 530. 22 expended on St. Mary Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325, 642 and South Saskatchewan \$370, 093 provided by Department of Reconstruction. In addition, the following amounts were paid from P. F. R. A. Vote: South Saskatchewan - \$59, 568; Red Deer - \$33, 207.
- (h) General Survey charges now being paid from other P. F. R. A. Votes.
- (i) Amounts shown in notes (d), (e) and (f) to be added to this total.
- (j) Veterans' Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P. F. R. A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).

EXPENDITURES BY PROVINCES

PRAIRIE FARM REHABILITATION ACT AND SPECIAL VOTES UNDER ITS ADMINISTRATION

	April 1, 1935 - March 31, 1955			
	Manitoba	Saskatchewan	Alberta	British Columbia
P. F. R. A.				
Major Irrigation and Reclamation in the Prairie Provinces	4, 114, 329	36, 957, 316	6, 094, 279	
Land Reclamation, Construction and Development in B. C.	24, 951	3, 850, 777	35, 509, 840	
Land Protection and Reclamation	1, 539, 858			2, 981, 800
Dyking and Cut-off (Assiniboine, Manitoba)	287, 544			
Surveys and Engineering Costs	631, 880	2, 628, 331	2, 264, 658	130, 541
Administration	225, 672	1, 688, 024	1, 550, 686	129, 820
	6, 824, 234	45, 124, 448	45, 419, 463	3, 242, 161
				100, 610, 306

REVENUE

REVENUE RECEIVED FROM PROJECTS UNDER P. F. R. A. OFFICE

To March 31, 1955	
Pasture Operation and General Revenue	3, 569, 794
Irrigation Project Operation (Under P. F. R. A. Vote)	451, 806
Irrigation & General Revenue (Major Projects Vote)	978, 499
Total	5, 000, 099



APPENDIX VIII  
SUMMARY OF STATISTICS RELATING TO MAJOR P. F. R. A. PROJECTS

As at March 31, 1955

Community Pastures	
Pasture Units	62
Total fenced pasture area	1,696,900 acres
Area regrassed since 1939	190,548 acres
Water Development	
Total Small Water Projects	51,691
Total Community, Irrigation and Storage Projects	325
Bow River Irrigation Project	
Irrigable Area	240,000 acres
Travers Dam	
Length	3,000 feet
Base width	1,000 feet
Maximum Height	165 feet
Volume of Embankment	4,500,000 cubic yards
Spillway Capacity	7,700 c. f. s.

# Travers Reservoir

Total Storage	265, 000 acre feet
Useable Storage	100, 000 acre feet
Length	12 miles
Area	5, 700 acres

## St. Mary Irrigation Project

Irrigable area	500, 000 acres
St. Mary Dam	
Length	2, 536 feet
Base Width	1, 480 feet
Maximum Height	195 feet
Volume of Embankment	4, 500, 000 cubic yards
Spillway Capacity	53, 000 c. f. s.

## St. Mary Reservoir

Total Storage	320, 000 acre feet
Useable Storage	290, 000 acre feet
Length	17 miles
Area	11, 600 acres

# Proposed South Saskatchewan Project

## Irrigable Area

OVER 450,000 acres

## South Saskatchewan Dam

Length

10,000 feet

Height

200 feet

Volume of Embankment

40,000,000 cubic yards

Spillway Capacity

265,000 c.f.s.

## South Saskatchewan Reservoir

Total Storage

8,400,000 acre feet

Useable Storage

3,100,000 acre feet

Length

135 miles

Area

116,000 acres

## Pasquia Area

Area

135,000 acres

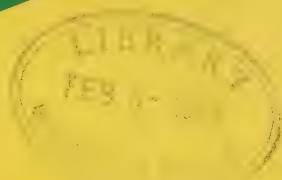






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# ANNUAL REPORT



ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1955-56



• CANADA ~ DEPARTMENT OF AGRICULTURE •  
• PRAIRIE FARM REHABILITATION BRANCH • REGINA • SASK •



PRAIRIE FARM REHABILITATION

and RELATED ACTIVITIES

1955 - 56





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## INTRODUCTION

The Prairie Farm Rehabilitation Act, as originally passed in 1935, provided for the spending of four and three-quarter million dollars over a five year period in measures to provide for the rehabilitation of drought and soil drifting areas in the Prairie Provinces. An amendment in 1937 extended the scope of the program by making specific provision for the withdrawal of poor quality lands from cultivation and the resettlement of the farmers operating such lands. By a further amendment in 1939 the five-year limitation was removed and the Act was continued in force indefinitely.

Many policies and projects have been carried out under the Act in the twenty years since it came into force. They vary widely in their nature and in their scope but each one has had as its objective the better utilization of land to minimize the problems of drought or the conservation of water for farm purposes. This Report endeavours to describe the various types of undertaking included in the P.F.R.A. program and to report the results achieved to date.

The organization developed within the Department of Agriculture to administer the Prairie Farm Rehabilitation Act has also been made responsible for the construction of other irrigation, land reclamation and land development works which, because of size or location, are not included in the actual P.F.R.A. appropriation. They are provided for by special votes of Parliament. These too are covered by the present Report.

While the Report is primarily concerned with the work done in the year 1955-56 it also deals in a general way with the P.F.R.A. and Special Project programs as a whole. Special consideration is being given to the Water Development Branch in this issue.





## ORGANIZATION AND ADMINISTRATION

The P.F.R.A. has its headquarters at Regina, Saskatchewan. It is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa.

The organization in Regina consists of the Director's Office, the Water Development Branch, the Engineering Services Branch and the Community Pasture Branch; the branch heads being responsible to the Director.

The Director's Office co-ordinates the activities of the different branches of work with the regional, district and special project offices. It also administers resettlement and rehabilitation activities, the Construction Equipment and Supply Division, the Land Division and the Planning and Information Division. In addition a Budget and Accounting Division maintains liaison with the Treasury Department.

The Engineering Services Branch is responsible for Surveys, Soil Mechanics, Drainage, Design, Hydrology, Hydraulic Studies, Air Photo Analysis and Engineering Geology, and Stream Bank Erosion Control. These services are co-ordinated to establish the feasibility of the many types of projects that the staff is required to investigate. The construction of major irrigation and reclamation projects is administered through project headquarters.

The Community Pasture Branch is an important part of land utilization. It undertakes construction of new pastures and supervises the operation of the community pasture network throughout Saskatchewan and Manitoba.

In addition to the Head Office in Regina there are Regional Offices in Winnipeg, Manitoba, and Kamloops, B.C., plus eighteen District Offices and nine Project Offices throughout the four Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and complexity of the particular project.

Since P.F.R.A. activities are closely allied to those of certain Provincial Government Departments, every endeavour is made to co-operate with these agencies. Similarly, the Branch maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and Hydrometric Service.

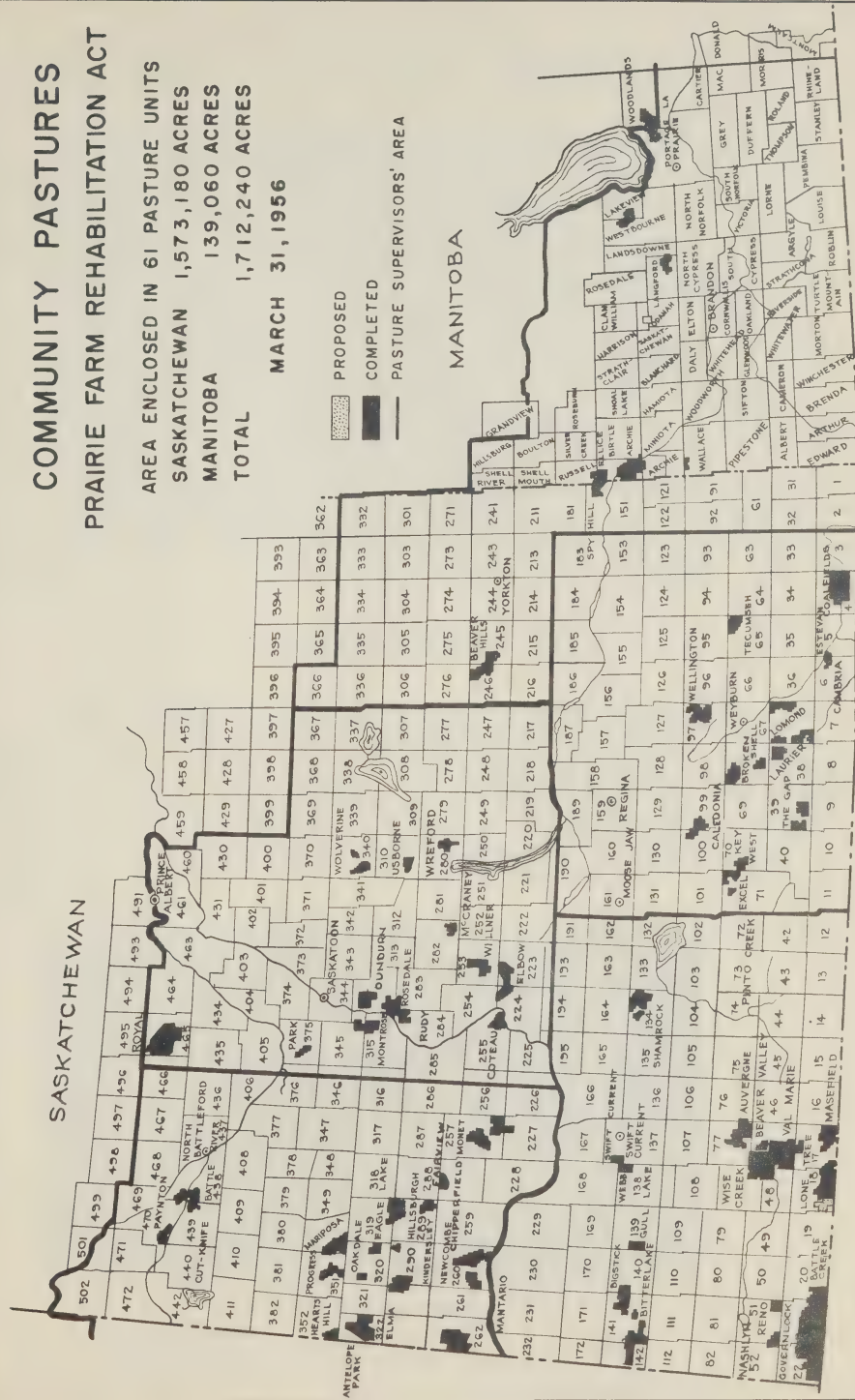
Fundamentally, P.F.R.A. is organized to carry out a program of work aimed at a greater security and stability for prairie agriculture.



# COMMUNITY PASTURES PRAIRIE FARM REHABILITATION ACT

AREA ENCLOSED IN 61 PASTURE UNITS  
SASKATCHEWAN 1,573,180 ACRES  
MANITOBA 139,060 ACRES  
TOTAL 1,712,240 ACRES  
MARCH 31, 1956

PROPOSED  
COMPLETED  
PASTURE SUPERVISORS' AREA







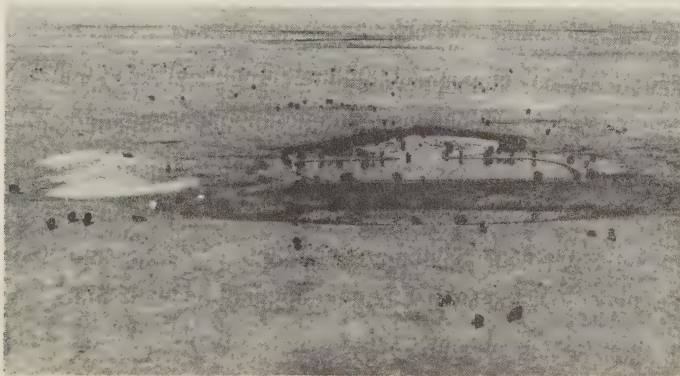
## THE COMMUNITY PASTURE PROGRAM

The purpose of the P.F.R.A. Community Pasture Program is to effect the better utilization of prairie land by permanently withdrawing areas proven unsuitable for cultivation from crop production and the establishment thereon of controlled grazing in community pastures. By agreement with the Province of Saskatchewan and Manitoba lands considered to be uneconomical for the production of crops have been transferred to the Federal Government and developed by P.F.R.A. for pasture purposes. The program consists of pasture construction, pasture improvement and pasture operations. Since the inception of the program in 1937, a total of 1,712,240 acres of land have been developed and operated as 61 separate pasture units with a manager in charge of each unit. During the 1955-56 fiscal year these pastures provided spring, summer and fall grazing for 108,537 head of livestock belonging to 5,632 patrons.

Details of Community Pasture Program activities during the 1955-56 fiscal year are contained in the following sections. Statistical information in regard to pasture acreage, construction costs, numbers of livestock pastured, and revenue from pasture operations will be found in Appendices I and II at the back of the report.

### Pasture Improvement

Lands enclosed in community pastures are reclaimed and otherwise improved for pasture purposes. Overgrazed pasture land and abandoned farm land in a drifted and weedy condition are sown down to permanent grass cover. Watering facilities in the form of dugouts, dams, wells and springs are established in areas where there is a lack of an adequate water supply. Grazing and pasture management policies are established compatible with good grass conservation practices to ensure the continuing productivity and maximum utilization of the resources available in the pastures.



The effective utilization of grass resources in community pastures is largely dependent on the availability of suitable stockwatering sites such as that pictured.

Ref # A581

Since the inception of the program in 1937, considerable progress has been achieved in this regard. Largely due to the success of the pasture improvement program, the carrying capacity of pastures has been more than trebled. Efforts are now being intensified to further increase the productivity of community pastures. A program of work involving the application of engineering principles to the problems of pasture improvement has been instituted. This work has as its objective range land improvement through clearing and seeding down to grass currently wooded land and other low producing areas, drainage, water development for stockwatering and irrigation, contour furrowing and the application of other known methods of conservation.

A four-member committee was appointed in 1955 along with an engineer to take charge of the pasture improvement work. Acting on the committee are representatives of the Hydrology, Construction Equipment, Aerial Surveys and Pasture Divisions who advise and assist in the co-ordination and carrying out of the pasture development program.

The following is a brief resume of the pasture improvement work undertaken during the 1955 construction season:

#### Regrassing

During the 1955 season 2,535 acres were regressed in 15 community pastures. This total was made up of 236 acres of mixed grasses for hay, 320 acres of crested wheat grass and 1,979 acres of crested wheat grass and brome.

#### Construction

Extensive brush clearing operations were conducted in the Beaver Hills, Royal and Park pastures during 1955 involving an area of over 2,450 acres. This work was accomplished mostly with the use of rotary brushcutter type equipment which shreds all brush up to 3 inches in diameter and can be drawn by a two-plow type pasture tractor. Over 1,000 acres of the cleared land was in the form of fireguards around blocks of wooded land intended for burning. On the Langford pasture clearing and regressing operations were conducted on an experimental basis under the supervision of the Federal Experimental Station at Swift Current, Saskatchewan. Rhoem discing was used quite successfully in knocking bush down.

Five hundred acres of high grade hay producing land in sloughs in the Beaver Hills pasture were reclaimed by controlled drainage. A further 550 acres of flooded hay meadow land in the southwest corner of Govenlock pasture and in Beaver Valley pasture were surveyed for drainage. On the Val Marie pasture several schemes were surveyed to drain groups of small sloughs into centrally located storage works creating a more lasting supply of water for stockwatering purposes.

Surveys conducted in the Val Marie, Masefield, Caledonia and Coalfields pastures led to the construction of 2 new dugouts, 12 new dams, the renovation and repair of 17 existing dam structures, and the completion of site locations for a further 2 dugouts and 7 dams. In addition, surveys for the establishment of a 500 acre flood irrigation scheme in Reno #1 pasture and proposed irrigation developments in Battle Creek, Govenlock, Big Stick and Bitter Lake pastures, involving over another 1,000 acres were completed during the year.

Five hundred acres of land on the Val Marie pasture was contour furrowed on a trial basis to determine the effect of such measures in conserving moisture to increase range land carrying capacity.



Land contour furrowed in the Val Marie Community (Reserve) Pasture for the purpose of soil and water conservation. Ref # 10600

Plans are presently being drawn up to increase and expand the activities of the Pasture Improvement Branch in the coming year. Through the activities of this section it is hoped to eventually double again the carrying capacity of community pastures and proportionally their value to the agricultural economy of the country.

#### Pasture Construction

Ten crews were actively engaged in pasture construction work during the 1955-56 fiscal year.

In addition to the building of several minor extensions to existing pasture areas, P.F.R.A. fenced a 13,290 acre extension to the Bitter Lake pasture, and a 24,000 acre extension to the Dundurn pasture. Progress was also reported in the construction of a 7,000 acre extension to Coalfields pasture and on the development of a new 17,000 acre pasture in the R.M. of Fairview #259. In total, 16,629 acres were added to the acreage in Community Pastures during the 1955 construction season. A complete summary of pasture construction operations to March 31st, 1956, is presented in the following table:





New fence construction on the Woodlea Community  
Pasture, Manitoba. Ref # 3755

Summary of Pasture Construction Activities  
to March 31, 1956.

Particulars	Projects Completed in 1955	Repair Work Completed in 1955	Total to March 31 1956
Fencing	107 1/4 miles	30 miles	4,400 miles
Corrals	9	4	153
Texas Gates	19	8	213
Buildings:			
Pasture Mgr. Dwellings	1	3	51
Rider's Cabins	4		26
Barns	13		93
Garages	1	1	49
Other (Granaries, bullsheds, livestock shelters, etc.)	17	9	231
Water Development:			
Wind Mills	3	2	309
Pumps		4	349
Wells	5	10	298
Springs	4		133
Dams			326
Dugouts	5		384

As is the adopted practice, the services of key construction personnel were retained for the winter months and assigned work in the P.F.R.A. Warehouses at Regina and Moose Jaw, building and repairing trailers, watering troughs, truck boxes, corral gates, tractors, diggers, fencing tools, etc., in preparation for the next construction season.

### Pasture Operations

Due to the uncommonly early freeze-up in the fall of 1955, the grazing season in community pastures was shortened materially. Excellent grass growth was reported in all pastures, however, and water supply was reported generally good. Farmers numbering 5,959 grazed 108,527 head of livestock in community pastures during the season. This represents a slight decrease in the number of pasture patrons as compared to 1954 but an increase in the total number of livestock pastured. The decrease in the numbers of pasture patrons has been attributed to the excellent condition of farm pasturage which made it unnecessary for farmers to move their cattle away from home.

### Pasture Fees

No change was reported in the grazing or service fees charged for pasture privileges.

### Haying

During 1955 a total of 4,500 tons of hay were cut and stacked in community pastures. This was made up of crested wheat grass, mixed grasses and wild hay. Hay is harvested by farmers on share agreement. The above total of tons of hay harvested refers to all hay produced, as distinct from that portion turned over to the pasture under agreement.

### Grass Seed Harvest

Grass seed harvested in pastures during 1955 amounted to 30,700 pounds of crested wheat grass and 6,900 pounds of brome grass. The majority of the grass seed was obtained from Govenlock, Nashlyn and Rudy pastures in Saskatchewan. The seed will be used for the regrassing of lands for future grazing.

### Breeding Service

At the request of pasture patrons, the breeding policy has been continued. P.F.R.A. uses and maintains purebred, beef breed bulls in community pastures as a service to pasture patrons. Patrons are charged for the breeding of their stock in an amount based on the average cost, the average length of service and the average amount realized from the sale of the bulls at the time of disposal. Since the service was instituted over 2,000 bulls have been used by P.F.R.A. in pasture operations. During the 1955 grazing season P.F.R.A. used 860 purebred bulls in its breeding service including 783 Hereford, 70 Short-horns and 7 Angus. These bulls serviced an estimated 23,000 cows leaving a 90% calf crop. The breed of bulls used on the pastures is based on the recommendations made by the respective pasture committees.

## Livestock Insurance

In order to offset losses, which are inevitable in all livestock operations, a policy of livestock insurance is carried in the majority of Community Pastures operated by each pasture committee. The matter of carrying livestock insurance is debated and decided on by the patrons at the Annual Meeting of each pasture. Two forms of livestock insurance are in operation, one is a Mutual Policy, which is handled entirely by the respective pasture organization and operated in 27 pastures in 1955; the other is a Line Company Policy, which is a bonded company policy handled by a local insurance company of Regina. This was carried in 11 pastures in 1955. Both forms of livestock insurance are proving generally satisfactory to the patrons directly concerned. Livestock losses from all causes whatsoever in Community Pastures during the past year were very low in comparison to the scale of the operations, amounting to 567 cattle and 7 horses, which is less than one-half of 1%. Out of this number the owners of 259 cattle and 5 horses were compensated under the terms of the respective livestock insurance policy by which they were covered.

### Livestock Insurance and Losses

27 Pastures carried Mutual Insurance  
11 Pastures carried Line Co. Insurance

#### Mutual Insurance

Total Losses in 27 pastures carrying Mutual Insurance -  
279 head of cattle and 1 horse.

Eligible for insurance 221 cattle no horses.

Premiums collected 1955-56

\$ 24,329.70

Indemnity paid

14,003.07

Surplus 1955-56

\$ 10,326.63

Surplus from previous years

27,189.49

Total surplus to date (27 pastures)

\$ 37,516.12

#### Line Co. Insurance

Total Losses in 11 pastures carrying Line Co. Insurance -  
80 head of cattle and 6 horses.

Eligible for insurance 38 cattle and 5 horses.

Premiums collected 1955-56

\$ 5,951.50

Indemnity paid

3,035.25

Surplus 1955-56 Line Co.

\$ 2,916.25



## RESETTLEMENT AND REHABILITATION

In accordance with the Government of Canada's rehabilitation policies as specified under the terms of the Prairie Farm Rehabilitation Act, farmers are assisted to move from lands on the prairies designated as unsuitable for crop production, and become re-established. Lands vacated by these farmers are regressed and otherwise improved for community pasture purposes.

Resettlement may only involve local moves within the same municipality but onto land more suitable for dry farming operations. Resettlement may also involve long distance moves to areas both physically and climatically more suitable for cultivation. In many instances, irrigation development has provided the answer to the problem of resettlement, and projects have been built by the Government of Canada specifically for this purpose.

The following is an account of those irrigation projects in Saskatchewan and Alberta which were built for resettlement and rehabilitation purposes and which the P.F.R.A. on behalf of Canada is continuing to operate.

### VAL MARIE IRRIGATION PROJECT

This project located on the Frenchman River near the town of Val Marie in southwestern Saskatchewan contains some 6,000 acres of irrigable land. It was one of the first such irrigation projects to be built by P.F.R.A. for resettlement and rehabilitation purposes. Water for irrigation is supplied from Cypress Reservoir in the Cypress Hills via the Frenchman River. A dam on the Frenchman River at Val Marie provides local storage to meet peak demands for water.



Border dike irrigation on the Val Marie Irrigation Project using portable aluminum syphons to divert water from the irrigation canal on to the land.

Ref # 10635



Seventy-eight farmers cropped land on the project during 1955 with major emphasis being given to forage production. Through this form of production farmers can be assured of adequate winter feed supplies for their livestock and of feed reserves to carry stock over dry periods. A steadily increasing livestock population in the Val Marie district is the direct result of feed being available from this project, and this in turn is providing increasing stability to agriculture in the area.

P.F.R.A. work on the project during 1955 included the excavation of 3 1/2 miles of main drain through the southernmost extremity of the project and the making of considerable minor repairs and improvements to the project's irrigation works. In addition, 230 acres of land in the Greasebrush area of the Center Block and southwest portion of the South Block, were seeded to grass for use as irrigated pasture.



Feeding cattle which are being wintered on Grant's farm on the Val Marie Irrigation Project.

Ref # 2721

The production of forage on irrigated land at Val Marie was up in 1955 from the previous year to 2,900 tons in spite of heavy July rains and an early frost which prevented many farmers from taking a second cutting of hay. During the late fall and winter months 400 head of livestock were brought into the project to utilize the aftermath of the hay harvest and hay crop that did not receive second cutting.

## WEST VAL MARIE IRRIGATION PROJECT

The West Val Marie Irrigation Project contains 3,500 acres of irrigable land. The present acreage prepared for irrigation is 2,775 acres and there are 600 additional acres currently undergoing development.

During 1955 permits and leases were awarded to 40 farmers to harvest hay off 1,716 acres on the project. Eight hundred acres of partially irrigable land were also used for hay production and grazing by the Val Marie Community (Reserve) Pasture.

Development of the West Val Marie Irrigation Project has now reached a stage so that the land can be subdivided and turned over to farmers on sale agreement. Seventeen lots were surveyed during 1955. Eleven have been taken up and applications have been received for the remainder. As in the case of the Val Marie Project, assured feed supplies grown on the West Val Marie Irrigation Project supplemented by summer grazing provided on the adjoining Val Marie Community (Reserve) Pasture, provide the key to successful livestock production in this area.

## EASTEND IRRIGATION PROJECT

There are approximately 2,750 acres of irrigable land on this project operated by 44 plot holders. Livestock production is noticeably on the increase in this area with the assurance of plentiful feed supplies provided by the irrigation project. Figures obtained from a recent livestock census show an increase of 100% in livestock numbers in the area since 1950 with the total population owned by plot holders today amounting to 2,900 head of cattle and 2,200 head of sheep. In this way farmers have been able to improve the land use on their farms and in general create more efficient and economic farming units.

After years of operations a stage has been reached where the project is in need of certain repairs and improvements in order to maintain maximum irrigation efficiency as a feed-producing area. Special attention has been given to this work in recent years which has involved land levelling, repair and replacement of irrigation structures, development of improved drainage facilities, control of weeds and regrassing along roadways and ditch banks. In connection with this work, P. F. R. A. laid approximately 2,000 feet of tile in the Kendrick site during 1955 to improve drainage in that area and studies were continued to determine the extent and solution to drainage problems in other sections of the project. In addition, 200 acres of farm land were releveled for farmers using a P. F. R. A. scraper plane leveller.

## CONSUL IRRIGATION PROJECT

The Consul project has a total of 2,450 irrigable acres apportioned out to 37 plot holders. In addition to the above, there are approximately 200 acres of spring-flooded meadows at Nashlyn that are operated in conjunction with the Consul project for community pasture purposes.

Development of land on the project is now almost complete. The demand for irrigated land for feed production has been great and applications for irrigated plots of land in the area have greatly exceeded the number of plots available. This

demand for hay indicates that feed produced on dry land farms is not sufficient to support cattle in dry seasons and that irrigable lands are necessary to supplement dry land production for winter feed and during prolonged dry periods.

During 1955, farms on the project harvested 2,500 tons of hay, 700 bushels of barley, 13,000 bushels of oats and 23 bushels of wheat. In addition, 80 acres of hay land were utilized for irrigated pasture. One thousand, three hundred and fifty acres of second hay crop, which due to adverse weather conditions could not be harvested, were also used for grazing.

### MAPLE CREEK IRRIGATION PROJECT

This project has a total irrigable acreage of approximately 5,000 acres including the Maple Creek Flats adjoining the town of Maple Creek, and the "V" irrigation flats 20 miles north of town. In addition, an extra 3,500 acres of private flood schemes take water along the stream course through P.F.R.A. works. In the Cypress Hills above the P.F.R.A. works, individual ranchers draw water from the streams to irrigate a further 1,200 acres of land.



The Maple Creek Irrigation Project serves a farming and ranching area 50 miles in radius in and around the project with livestock feed supplies.

Ref # 1790

More cattle are shipped from the Maple Creek District than from any other shipping point in the province despite the fact that it has one of the highest percentages of non-productive sandy soils in Saskatchewan and is known to be one of the driest areas on the prairies. The success of the livestock industry is largely due to the stabilizing influence the irrigation project has had on the livestock economy



of the area. Hay produced on the project in 1955 totalled 12,000 tons, serving 150 farm units with a total livestock population of 9,500 head of cattle and 3,000 sheep.

A peak run-off in the spring of 1955, one of the heaviest in the project's history, damaged some of the diversion works in the headwaters of Maple Creek which were not designated to withstand such heavy floods and had been built in early years with untreated lumber. These works were repaired and replaced during the summer with more suitably designed and constructed structures.

A problem in certain areas of the project and particularly the "V" has been a high water table which has caused the land to become alkaline and unproductive. Several improvements have been carried out in recent years to remedy this situation involving canal lining, deep pump testing, development of improved drainage facilities and land levelling. The latter three operations were again carried out aggressively in 1955 to get better use of land and water on the project.



Second operation levelling on Lot 29 of the Maple Creek Flats, Maple Creek Irrigation using an automatic land plane type leveller. Ref # 4210

A program of land development is also being carried on to bring additional acreage under irrigation. During 1955, 250 acres of new land were levelled and otherwise prepared for irrigation in the Maple Creek Flats district. Further irrigation development at Maple Creek is limited by the availability of existing water storage facilities. This is being remedied in large part by the construction of Harris reservoir which was all but completed in 1955.



## SWIFT CURRENT IRRIGATION PROJECT

There are 21,000 acres of irrigable land on this project of which some 12,000 acres are currently undergoing development in the Swift Current, Waldeck, Rush Lake and Herbert districts. The irrigable land in the Swift Current, Waldeck and Herbert districts are nearly all privately owned and development is being undertaken by the owners with assistance provided by the Conservation and Development Branch of the Saskatchewan Department of Agriculture. P.F.R.A. has agreed to deliver water to these districts at a nominal charge. Almost all land in the Rush Lake district is Crown owned and is being developed by P.F.R.A. in accordance with its rehabilitation policy. There are approximately 4,700 acres of irrigated land in the North Rush Lake Flats and 1,400 acres of land now served with water in the South Rush Lake area. The land is leased out to farmers on a yearly basis for the production of hay and fodder crops.

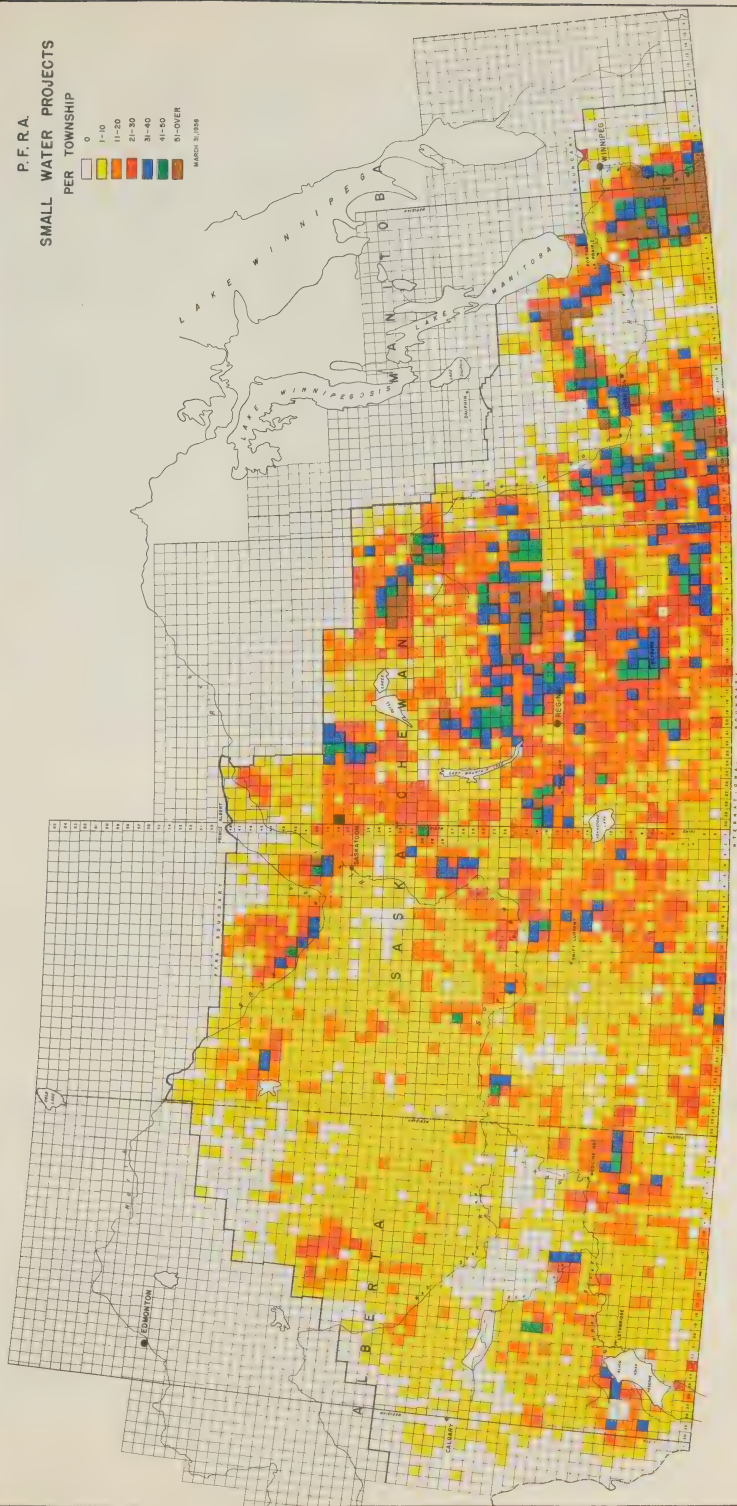
One hundred and fifty farmers operated land on the Rush Lake Flats during 1955. Approximately 5,000 tons of hay were harvested as well as 85,250 bushels of oats and 15,625 bushels of barley. An agricultural improvement program on the Rush Lake Flats has been carried on by P.F.R.A. to guide the lot holders in irrigation farming methods. As a result of this program, there is a decided trend for farmers to seed more land to forage. This was quite noticeable in 1955.

An extensive drainage construction program was also carried on in 1955 to improve surface and subsurface drainage in areas of the project where high water table conditions exist. A more detailed account of this work has been given under the Engineering Services section of this report dealing with the activities of the Drainage and Irrigation Division of P.F.R.A. during 1955.

## BOW RIVER IRRIGATION PROJECT

The development of irrigable land in the Hays district of the Bow River Irrigation Project is being undertaken to provide suitable land for the resettlement and rehabilitation of farmers from drought areas on the prairies. A farmer qualifying for resettlement may obtain an economic unit of irrigable land in the Hays district of the Bow River Irrigation Project in exchange for his dry land holdings. The lands vacated by the farmer and turned over to Canada are re-grassed and otherwise improved for pasture purposes in accordance with the Federal Government's rehabilitation policies. Further details of this work will be found under the section of this report dealing with the Bow River Irrigation Project.

P.F.R.A.  
SMALL WATER PROJECTS  
PER TOWNSHIP



Scale 1:100,000



## WATER DEVELOPMENT PROGRAM

On the theory that water or the lack of it is the principal limiting factor in agricultural production on the prairie, the object of the P.F.R.A. Water Development Program is to develop the resources in such a way as to do the most good and benefit the greatest number of people.

Three categories of work are carried out by the P.F.R.A. Water Development Branch with a view to achieving this end.

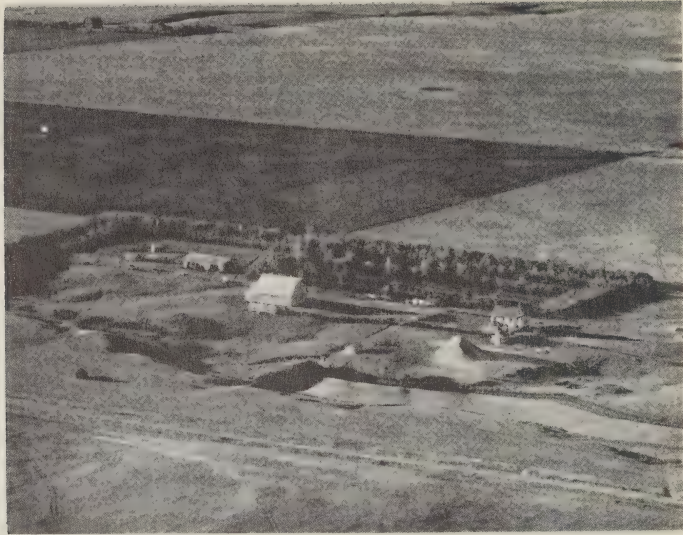
1. Financial assistance is provided by P.F.R.A. for the construction of small individual and neighbor projects in the form of dugouts, dams for stockwatering and irrigation works. Farmers may receive financial help to construct such facilities on a self-help basis in an amount relative to the size of the project and the use which will be made of it. All engineering services required by the farmer to design and build the works are offered by the organization free of charge.
2. Groups of farmers may apply for P.F.R.A. assistance for the construction of larger community sized projects located on the more well defined prairie watersheds. The help P.F.R.A. provides is determined on the basis of individual merit and how much the farmers themselves are able to contribute toward the cost of construction.
3. P.F.R.A. may also agree to undertake the construction and financing of irrigation and water storage projects where it is in the public interest of the country to do so and when the project is too big to be handled, even in part, by local bodies, yet too small to come under the category of major irrigation and reclamation works. The generally accepted rule in such cases is that P.F.R.A. will build the capital works and the Provincial Government concerned will undertake the development of the land and irrigation distribution system.

Activities of the P.F.R.A. Water Development Branch during the 1955-56 fiscal year were as follows:

### Individual and Neighbor Farm Projects

Individual farm projects refer to those benefiting one farm only while a neighbor project refers to works undertaken by two or more farmers but which do not cost in excess of \$5,000.00.





An individual stockwatering dam located on a farm south of Weyburn which was built under the PFRA water development self-help plan. Ref # A184

During 1955 a total of 743 individual and neighbor projects were completed bringing the total of small projects built with P.F.R.A. assistance since the inception of the water development program in 1935 to 52,462. Of the number constructed in 1955, 494 were dugouts, 145 were stockwatering dams and 104 were small irrigation schemes. For the work carried out on these projects during the past year P.F.R.A. reimbursed farmers to the extent of \$94,998.84. This figure represents approximately one-third of the total outlay for the construction of these projects. The rates of assistance paid on construction remained the same as in the previous year.



Irrigating a prairie farm garden from a small water storage reservoir. Ref # C168

## Community Projects

Of the 40 community projects started in 1955, 32 were completed. These consisted of 17 community dugouts, 8 community stockwatering dams and 7 community irrigation schemes.

Of special note in regard to community water development in recent years has been the growing interest shown by towns and villages on the prairies to utilize water storage works as a secondary benefit for domestic water supply. This trend is particularly apparent in the Medicine Hat-Hanna districts of Alberta and several towns have taken advantage of such possibilities to improve their local private and public utilities. The most recent example of this trend is in the case of the Hilda project; a dugout for agricultural use with a capacity of approximately 8,000,000 gallons which was constructed in 1955 to serve the Hilda rural area with an assured water supply. The dugout is filled by pumping from sloughs in the run off season of the year. A similar scheme was also completed in 1955 to serve the rural area of Schuler and construction of another water supply scheme was started for the Provost district further north near the Alberta-Saskatchewan boundary. To these districts, for whom no other suitable source of water supply exists, the blessings of water development are manifold.

Much of the land presently being developed for irrigation on community schemes is being devoted to irrigated pasture. Under proper management these pastures may be expected to carry up to one head of livestock or more per acre throughout an entire summer as compared to 30 and 40 acres per head on open range land. The farmer can thus be assured of high quality pasturage for his stock within a manageable small area and many farmers with limited pasturage are turning to the use of irrigated pastures as an answer to their problem. Farmers are also giving increasing attention to the building up of hay reserves that have been produced on community irrigation projects for the winter feeding of livestock and as an insurance against future dry years when other sources of feed supply may become scarce.

## Irrigation and Water Storage Projects

The principal irrigation and water storage works undertaken by P.F.R.A. during 1955 included the near completion of the Oak Lake-Pipestone project in southwestern Manitoba, construction of Harris Dam on the Maple Creek Irrigation Project in southwestern Saskatchewan, commencement of construction of the Lafleche Dam on the Wood River near the town of Lafleche in south central Saskatchewan, and the construction of the Hugonard storage project at Lebreton, Saskatchewan. A contract was also let in 1955 for the construction of the Rock Lake Project located between the towns of Brooks and Duchess in Alberta, but no work was accomplished on the contract during the 1955-56 fiscal year.

### OAK LAKE-PIPESTONE PROJECT

The purpose of this project is to control the floodwaters of the Pipestone Creek. During the dry years, the Pipestone farming area had a serious soil drifting problem. As a result the Pipestone Creek was filled with drift soil. With the

return to better climatic years and unprecedented rainfall, floodwaters could not pass down the natural water course and caused damage to many thousands of acres of land. This project serves many purposes, such as reclamation, flood protection and regulated flood irrigation of hay meadows. Construction calls for the excavation of a diversion channel some 4 miles in length and a system of dikes along the Pipestone Creek and for improvement works on the upper end of Plum Creek, the outlet to Oak Lake, in order to increase its discharge capacity.



A newly constructed dike along Pipestone Creek on the Oak Lake--Pipestone project built by PFRA to prevent flooding of adjacent agricultural lands.

Ref # 10594

During 1955 work was completed on 2 construction contracts; \$107,612.10 for the construction of the dikes along Pipestone Creek and a contract in the amount of \$31,709.00 for the construction of two bridges on the diversion channel. Work on previous contracts carried into 1955 was also close to completion by winter freeze-up. Little new work will be required in 1956 to fully finish the project.

#### HARRIS DAM AND RESERVOIR-MAPLE CREEK IRRIGATION PROJECT

This project is being undertaken in order to supplement existing water storage facilities on the Maple Creek Irrigation Project. The capacity of the proposed reservoir at full supply level will be in the neighborhood of 5,000 acre feet. Early winter weather prevented completion of this project in 1955. Construction was well enough advanced, however, to provide some storage from the



1956 spring run off to supplement existing water supplies for irrigation. A remaining 7 feet of fill and rip rap is needed to complete the project which will be placed early in 1956.

#### LAFLECHE STORAGE PROJECT

The contract for the construction of the Lafleche Dam was let in 1955 for \$429,423.15. The project will create storage on the Wood River for over 30,000 acre feet of water which can be utilized for irrigation, stockwatering and domestic supply. Approximately 25% of the contract was completed in 1955.

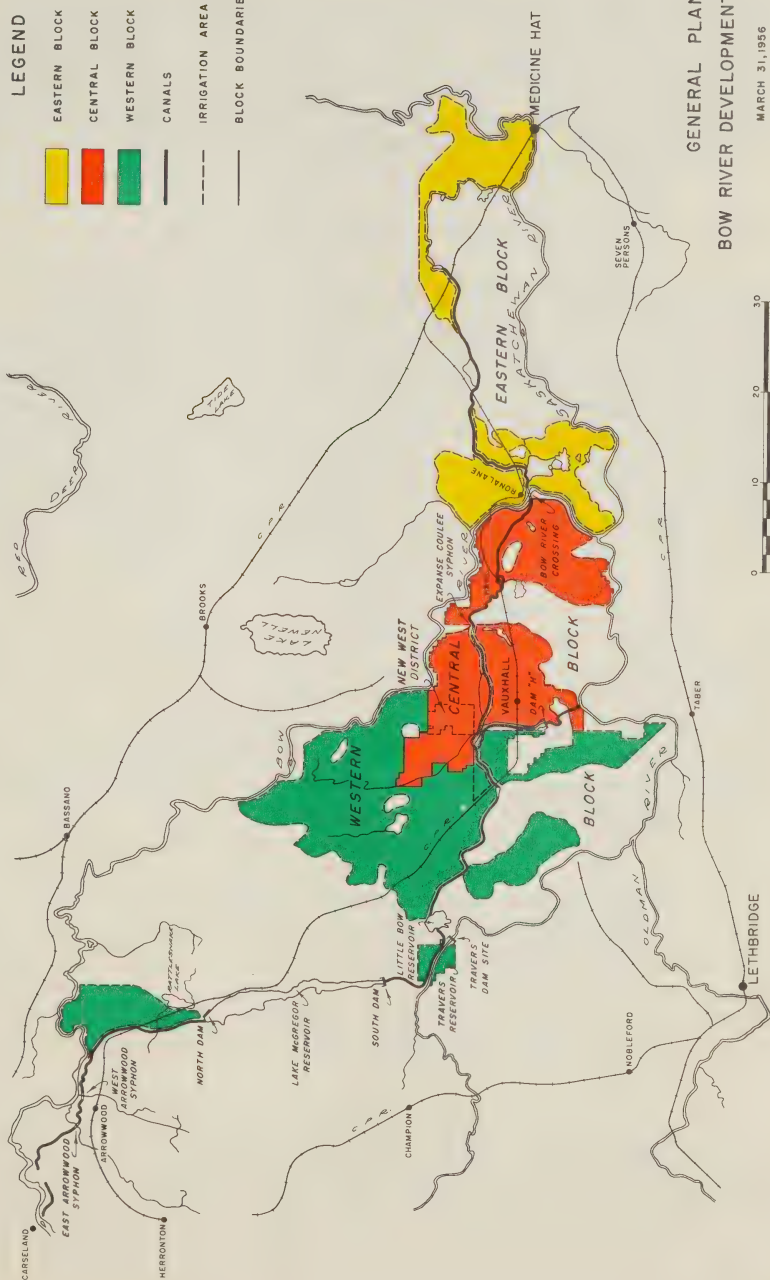
#### HUGONARD STORAGE PROJECT

The purpose of this project is to provide a water storage for stockwatering and domestic water supply for the town of Le Bret and Le Bret Indian School. The storage will also be utilized to irrigate the gardens of the Le Bret Indian Farm and School. Construction of the Hugonard Dam began in 1955.





- LEGEND**
- EASTERN BLOCK
  - CENTRAL BLOCK
  - WESTERN BLOCK
  - CANALS
  - IRRIGATION AREA BOUNDARIES
  - BLOCK BOUNDARIES



**GENERAL PLAN**  
**BOW RIVER DEVELOPMENT PROJECT**  
 MARCH 31, 1956



## MAJOR IRRIGATION AND RECLAMATION PROJECTS

In recent years P. F. R. A. has entered into the development of larger irrigation and reclamation works in western Canada which, either because of their size or location, have not been included under the regular P. F. R. A. appropriation. These projects are undertaken by agreement between the Federal Government and the Provincial Government concerned on a cost-sharing basis. These major irrigation and reclamation projects are sometimes referred to as special projects and expenditures are made under special votes of Parliament.

### The Bow River Irrigation Project

The fiscal year 1955-56 marks the fifth year of Government operation of the Bow River Irrigation Project. Progress can be reported in all phases of project development and operation. The first and major step in development, namely, the renovation and enlargement of the original project, was all but completed in 1954. Development work during 1955 was largely one of cleaning up odd jobs and improving the efficiency of the irrigation system where this had proven, through operation, to be necessary. The work still to be completed will include providing necessary structures to add miscellaneous small tracts of land to the existing irrigated area. In addition there are still major improvements to be made to Carseland Diversion dam and to Lake McGregor. The weir in the north channel at Carseland failed in 1955. It has been replaced temporarily by an earth fill. Studies of a number of alternatives for a permanent repair are under way. Both North and South Lake McGregor dams require wave protection on the water slope, and Lomond Crossing has to be raised above the high water level of the reservoir.

From an operational standpoint, weather conditions during 1955 were favourable and crop production proved excellent. Despite the difficulty of obtaining a ready sale for wheat in other areas which in turn had a tendency to reduce net farm income for the year, retail merchants of farm equipment and suppliers reported no significant decrease in total farm sales. Collections made by P. F. R. A. on land and water contracts for irrigation were also good and did not mirror any trend toward a lowering in farm prosperity.

The progress of farmers newly settled on irrigated land in the Hays District of the Bow River Project was also gratifying, the majority of the farmers showing zealous interest in making a successful venture out of their new irrigation farming enterprise.

Details of P. F. R. A. activities on the Bow River Irrigation Project for the 1955-56 fiscal year are outlined in the following sections:

#### Construction

Major repair work was undertaken on the Carseland Diversion Weir on the Bow River in 1954. Construction of the North Weir of the diversion was completed the same year. Repairs to the South Weir apron and island abutment were completed in February 1955. In April 1955, P. F. R. A. crews began work on the South Weir outlet structure, installing radial type headgates in place of stop-logs which were cumbersome and leaking badly. This latter work was completed in



mid-June. No further work was proposed on any part of the diversion works for the 1955 season, but on May 26th word reached Vauxhall that a portion of the North Weir had failed. The failure had occurred in a section of the Weir between the last repair work done by the Canada Land and Irrigation Company and adjacent to the work done by P.F.R.A. in 1954. Since the failure did not appear to be getting worse, no action to repair the damage was undertaken until June flood conditions in the Bow River had subsided. An earth cofferdam was built across the stream channel above the break to close off the North Weir from the River. Further work on the Weir now awaits final decision on whether or not the concrete weir should be rebuilt.

Another major work undertaken in 1955 was the completion of a new outlet at the east end of the East Arrowwood Syphon.

At the Big Cut, trouble has been experienced through the years with slides occurring on its south bank and consequently partially blocking off the main water supply channel below them. In an attempt to eliminate the seepage and slide problem, the top of the bank was excavated in 1955 down to a point below the line of seepage, and perforated horizontal drains were installed leading the water to a gathering pool and thence down the slope to the canal bed by means of a metal pipe installed in a trench.

Installation of gates through the dam structure at the south end of Lake McGregor was begun in 1954 and completed in the spring of 1955. In order to carry the work forward it was desirable that the water level in Lake McGregor be maintained at as low an F.S.L. as possible during construction. A plug in the supply canal to Lake McGregor at Lomond Crossing was installed for the purpose and removed after the work was completed.

Limitations placed on the delivery of water to the south end of Lake McGregor due to construction caused concern as to whether there would be sufficient water in storage in the Lake at the end of the season to insure water requirements for a full year of irrigation operations on the project in 1956. Fortunately all irrigation requirements in 1955 were met with water supplied entirely from the Little Bow River. Except for a period of about 3 weeks, when a small stream was let down from Lake McGregor, delivery of water from the Lake was not found necessary. Therefore, by September it was possible, when once again water was allowed to run freely through the channel at Lomond Crossing, to pass water into south Lake McGregor in sufficient quantities to replenish whatever deficiencies in water supply there might have existed.

Some drainage improvement work was undertaken on the floor of the inlet structure to Travers Reservoir. In addition, a guard rail across the top of Travers Dam was built and the 12" pipe running through the four-foot river diversion pipe at the Dam was permanently plugged with concrete. The channel below the four-foot river diversion pipe was trimmed.

Contracts were let for the construction of a wasteway structure on the main canal at the inlet end of Expanse Coulee and another near Ronalane Bridge. No particular difficulty was experienced in the construction of the Expanse Coulee Wasteway. The structure begun in 1954 was completed in 1955. Construction of the wasteway near Ronalane Bridge began at the end of August 1955. Earthwork progressed satisfactorily and by freeze-up this phase of the work was nearing

completion. However, waterheld in storage above the works to supply the contractor with water required for use in the construction of a compacted earth fill and for concrete broke free to pour down through the incompleted wasteway causing serious erosion in its wake. Back filling and cleaning up operations caused considerable delay and expense. Further work on the spillway was suspended until early in 1956.



Aerial view of Expanse Coulee Syphon and partially constructed wasteway, Bow River Irrigation Project.  
Ref # A922

Finally back filling and trimming work was completed at three drop structures on the main canal (numbers 3, 5, and 7) and one new check structure,



New Drop 7 under construction on the main canal line of the Bow River Irrigation Project.  
Ref # A910

the Sundial Check, was completed and will be in operation in 1956. Contracts on the construction of another 5 canal check structures were let but not completed due to the early freeze-up.

In addition to the work referred to above, bank-building, strengthening and gravelling of roadways was carried out along several sections of the main canal. A program was also started this year to instal drainage inlets to the main canal wherever there appears to be a danger to the canal works from heavy run off.

#### Operation and Maintenance

The demand for water in 1955 was less than in 1954, despite the fact that rainfall was somewhat less. This can be attributed to the ideal timing of the rainfall. A total of 43,902 acre feet of water was delivered to farmers' head-gates during the year as compared with 57,915 acre feet of water during 1954. Of this year's total, 19,613 acre feet of water was delivered to 184 farm units at Hays, and 24,288.1 acre feet to 397 farm units in the Vauxhall area. In the Hays area, water was delivered for the first time to 29 new units comprising an area of 3,253 acres. To serve the new area, one new ditchrider was employed. P.F.R.A. now has four ditchriders in the Hays area, and eight ditchriders in the Vauxhall area to handle the delivery and distribution of water for irrigation on the Bow River Project.

Small amounts of water were delivered to Provincial lands in the West Block. None of this was used for irrigation, but rather for priming of new laterals, putting back fill on new structures and filling stockwatering ponds.

All of the water used in irrigating this year was taken from Travers Reservoir. All water diverted from Travers Reservoir for irrigation, a total of 94,200 acre feet, came from the drainage of Little Bow River as previously stated. The available storage in Travers Reservoir is presently down to 3,500 acre feet. This will be improved by the spring run off and/or by way of delivery from Lake McGregor.

Three maintenance crews constructed a total of 204 new irrigation structures and made repairs to 33 additional works. Earth moving equipment cleaned and enlarged 13.7 miles of irrigation canal, and rebuilt and strengthened 11 miles of lateral canal bank. Maintenance construction activities were mainly centered in the New West area of the Project.

#### Settlement

Settlement work was continued in 1955. Moving to the second category in the Federal Government's settlement policy, 17 sons of farmers in irrigated districts were settled during the year in the Hays area in addition to 18 new settlers from drought areas of Saskatchewan.

#### Land Development

Thirteen parcels containing 1,658 acres of new land in the Hays area were broken and disced twice in preparation for settlement in 1956. Eleven parcels of newly broken land in the Hays area containing 1,544 acres were levelled by P.F.R.A. in addition to 76 parcels of old land. Land levelling is undertaken by P.F.R.A. as a service to new settlers. The settlers are charged for this work on a cost basis, repayment for which is spread over a number of years.



In 1954 grass seed was unobtainable to sow on new construction, and rye was substituted. During 1955 all the borrow pits, roads, canal banks and new construction, from Expanse Coulee to Ronalane Bridge, were reseeded to crested wheat grass. Twenty thousand pounds of crested wheat grass was sown during the year. Seeding grass along canal banks and roadsides is greatly assisting in weed control. The early appearance of winter made it impossible to do as much seeding as had been planned. However, the program will be continued in 1956.

The work of reclaiming abandoned farm land due to seepage and alkali, estimated in earlier reports to include about 10% of the potential irrigable land in the older sections of the Vauxhall district, is now beginning to show results. The plan being followed is to get the land in shape by installing proper drainage, by cultivation and by land levelling. A cereal crop is then sown to obtain a cover into which a grass mixture is seeded which is recommended as suitable for irrigated pastures. The resulting irrigated pastures are operated as community pastures and are utilized by livestock growers in the irrigation district. Two such pastures have been established to date. It is anticipated that a third 350 acre irrigated community pasture will be developed the next year. One of the irrigated pastures, enclosing 350 acres of land located in Section 15-13-16 W4th just north of Vauxhall, carried 400 head of grown livestock and 250 calves from June 1955 to October 1955. On the second irrigated pasture in Section 22-13-16 W4th and Section 14-13-16 W4th, P.F.R.A. harvested 30 tons of hay from an area recently seeded to grass, as well as about 4,000 bushels of oats.

Development of a special problem area consisting of several hundred acres of flat land with a high water table is also presently underway. The question has arisen of whether the land in the area, located southwest of the Hays district and locally referred to as the Windmill Flats, should be developed and whether the area should be settled. Two small plots were broken, levelled and seeded to a mixture of oats and rye in 1955, to control soil erosion. A main tile drain into the Flats was constructed. Further reclamation work will be held in abeyance until the effects of drainage and the suitability of the land for irrigation has been proven.

#### Agricultural Activities

A grazing experiment to determine the most efficient means of utilizing irrigated pastures was carried out on a parcel of land in the Hays area in 1954. In that experiment cattle alone were used. During 1955 sheep as well as cattle have been included in the study, since a program of sheep on farms on the Bow River Project is being promoted.

Settlers are encouraged to develop irrigated pastures on their own farm to obtain better balanced income from the irrigation unit. Suitable pasture grass mixtures are being sown by farmers to improve and establish a better use of land and water.

High quality seed grain has been grown by farmers. During 1955 they grew 2,100 bushels of Thatcher wheat, 1,600 bushels of Dakota flax, 1,500 bushels of Trebi barley and 2,400 bushels of Eagle oats under this plan. The varieties mentioned were the recommended types for the Bow River region. New



recommended cereal varieties including registered Redwood flax and Rodney oats, together with Harlan barley, were multiplied in sufficient quantities to supply all the seed needs for 1956. To accommodate all grain produced in the Hays district, one 2,400 bushel metal bin and ten 3,200 bushel plywood granaries were erected.

Early in the spring of 1955, P.F.R.A. assisted farmers in the Hays area in a program to control army cutworms which threatened to damage crops grown on summerfallow land. Spraying with Aldrin was instigated. Results were gratifying but it was too late to save early sown flax. This was ploughed under and reseeded to barley and oats.

In July 1955, the prevailing winds carried an infestation of corn aphis from United States which settled on the late barley crop. The damage caused by the aphis was light, however, in comparison with other areas, as most of the barley sown was too far advanced to be damaged. Nevertheless, a program of spraying with Malathion was instituted by P.F.R.A. on 300 acres as a control measure.

### Hays Townsite

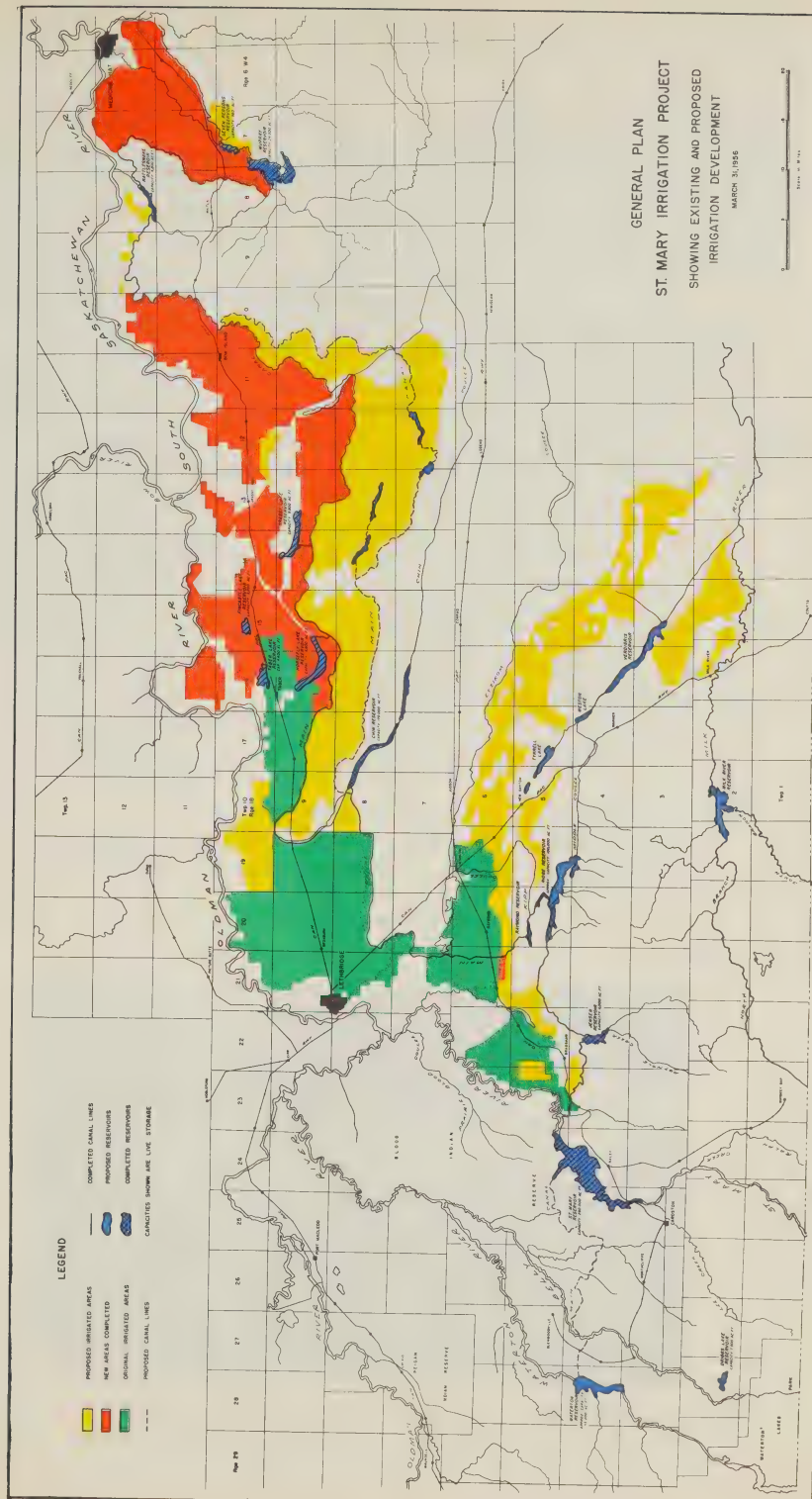
Three new building permits were issued during 1955 in the Hays Townsite. The Roman Catholic congregation excavated a basement and poured the footings for a 35' x 72' church. The Canadian Oil Company purchased a lot in the commercial district and opened a wholesale gas and oil sales warehouse in August 1955, and the Hays School District completed a seven-room school and auditorium that was officially opened December 2nd, 1955.

The school is of modern construction and provides for expansion to double its present capacity. One new teacher was hired for the fall and winter season of 1955-56 to provide for an increased school population. At present 110 children attend school at Hays and grades up to and including 9 are taught. Three school vans are used to transport the pupils to school.

### The St. Mary Irrigation Project

Construction work on the St. Mary Irrigation Project has now been completed to serve 168,000 acres of newly developed land in addition to assuring a dependable supply of water for 118,000 acres of land on earlier established sections of the project.

The project is a joint undertaking of the Government of Canada and the Government of Alberta having as its ultimate aim the provision of sufficient water to irrigate 500,000 acres of land in southern Alberta, by utilizing Canada's full share of three important international streams, the St. Mary, Belly and Waterton Rivers. Under the agreement, Canada has assumed responsibility for construction of all main reservoirs, connecting works and large dams between Waterton River and Ridge Reservoir, inclusive. The Alberta Government has assumed the responsibility for the construction of the distribution system from the main works with engineering supervision of construction provided by P.F.R.A. Development and colonization of the new irrigable areas is also undertaken by the Province. The work has mainly involved the expansion of existing irrigation works built in 1901 by the Alberta Railway and Irrigation Project with provision for more adequate storage and supply facilities as well as construction of extensions to the original distribution system.





## Construction

Construction by the Government of Canada during the 1955-56 fiscal year was confined to a start on the East Dam of Ridge Reservoir and to some small improvements along the main canal. Included in this latter work was the installation of the second barrel of the Pinepound Siphon system. A start on the construction of the diversion of the Belly River had also been planned for 1955, but difficulties in obtaining right-of-way concessions across the Blood Indian Reserve, forced postponement of this work.

Construction of the distribution system which is being carried out by the Province of Alberta under P.F.R.A. engineering supervision continued throughout the 1955 construction season bringing an additional 27,000 acres of new land under the ditch. Most of this development took place in the Medicine Hat area, with some further development in the Purple Springs area. The following table shows the progress made in the construction of the irrigation distribution system over the past 5 years:

Season	New Distribution Works Ready to Serve a Total Ac:	Old Districts Served Approximately	Water Delivered to a Total Of:	Water Delivered (Acre Feet)
1952	37,000 ac.	118,000 ac.	130,000 ac.	186,000
1953	54,000 ac.	118,000 ac.	135,000 ac.	196,000
1954	96,000 ac.	118,000 ac.	158,000 ac.	246,400
1955	141,000 ac.	118,000 ac.	159,700 ac.	190,000
1956	168,000 ac.			

Total expenditures from the inception of the project to March 31, 1956, in accordance with the agreement between the two governments are approximately as follows:

Government of Canada (through P.F.R.A.)	\$15,541,000.00
Government of Alberta	\$16,049,000.00



Aerial view of the St. Mary Dam and Reservoir as seen after almost five years in operation. Ref # 10637



### Operation and Maintenance

In accordance with the agreement between the Government of Canada and the Province of Alberta, the P.F.R.A. operates and maintains that portion of the project financed by the Government of Canada. An operation and maintenance staff is headquartered at the St. Mary Dam to carry out this work.



Irrigating a field of sugar beets, St. Mary's Irrigation Project. Ref # 4207

After a wet spring in 1955, the weather became dry during the month of June and the demand for irrigation water increased at a very high rate. By June 23rd the flow from the St. Mary Reservoir reached 1,800 cubic feet per second, an all-time peak flow. However, on July 1st, heavy rains over the entire project assured sufficient moisture to satisfy most crop requirements, and for the remainder of the season water consumption was limited to that required by the more specialized irrigated crops. Water used during the season, therefore, totalled somewhat lower than previous years, amounting to 190,000 acre feet.

### Saskatchewan River Reclamation Project

Studies have been carried out since 1950 to determine the possibilities of reclaiming an area of flat marshy delta land about 2,000,000 acres in size in the lower reaches of the Saskatchewan River which, according to soils reports, when properly drained, can be turned into good farm land. As a result of these studies a start was made in 1953 on the actual development of a portion of this area consisting of approximately 130,000 acres situated near the town of The Pas in Manitoba. During the fiscal year 1955-56 construction work was continued while at the same time further investigational work was continued elsewhere in the delta region.





### Construction (Pasquia Area)

The reclamation works in the Pasquia Area include a diversion dam on the Pasquia River, some 30 miles southwest of the town of The Pas, to divert water from the Pasquia to the Carrot River utilizing a system of dikes and cuts and making use of an older abandoned river course known as the Salt Channel (see map). This channel joins the Carrot River 22 miles west of The Pas. From this point, a continuous dike follows the south bank of the Carrot and Saskatchewan Rivers to a high glacial ridge at The Pas. The dike again crosses the Pasquia a short distance above its confluence with the Saskatchewan River. A control dam is located at this point which will help to regulate the drainage from the reclaimed area and exclude floodwaters from the Saskatchewan River by means of 4 six-foot conduits equipped with manually operated gates. The major portion of this construction work has been completed to date.



Seeding operations on trimmed section of newly constructed dike along a stretch of the Carrot River in the Pasquia area of the Saskatchewan River Reclamation Project. Ref # 4295

During 1955, diking along the Carrot River was practically completed. About 98% of the fill is now in place, but a considerable amount of trimming of side slopes remains to be done. All dikes are designed for 3:1 slopes with a 12 foot top and 30 foot berm between toe of the dike and edge of borrow pit. Berms and side slopes are being seeded to grass immediately after the completion of each section of dikes.

Construction of the main control dam near the mouth of the Pasquia River was also undertaken during the summer of 1955 and completed before freeze-up.



Since diking around the perimeter of the Pasquia area is now well in hand, attention was focussed on the second stage of development, namely, interior drainage. The first drainage contract, which consists of moving 400,000 cubic yards of earth, was awarded. Approximately one-third of this ditching contract was completed during the fall of 1955. Work on a pumphouse to provide an escape for the drainage water, which is under a separate contract, will not commence until the spring of 1956. A 50 c.f.s. capacity Johnston centrifugal pump unit was purchased and delivered to The Pas for installation when the pumphouse has been completed.



A newly constructed drainage channel in the Pasquia area of the Saskatchewan River Reclamation Project.

Ref # 4298

Due to the inaccessibility of some of the smaller drains which are proposed for the Pasquia area and which are not suited for contract work, it was decided to construct them by force account. During the current year approximately 52,000 cubic yards of earth were moved. This will greatly facilitate drainage in the remaining area.

#### Investigations

In order to determine the behaviour of floods in the delta area, it is necessary to have a good knowledge of local topography. For this purpose a series of cross sections of the whole delta were taken. The area covered during 1955 extends from the mouth of the Sipanok Channel to Cumberland House. Due to the wet terrain, it is only possible to carry these studies out during the winter months using dog teams and snowmobiles. Four survey crews were organized to carry out the work.

Hydrometric and sediment surveys in the Saskatchewan delta were continued throughout the summer of 1955. Three field parties, stationed at Sipanok Channel, Cumberland House and The Pas took suspended sediment samples, discharge measurements and gauge readings on the rivers and streams in the drainage system. In addition, two sediment-sampling stations were established on the North and South Saskatchewan Rivers at Borden Bridge and at Outlook. Topographic surveys between Tobin Rapids and The Pas were carried out by three field parties during the winter months.

### The South Saskatchewan River Development Project

Investigational activities on the South Saskatchewan River Development Project during the 1955-56 fiscal year were considerably less than previously. The main work undertaken consisted of extensive streamflow measurements, gauge readings and silt sampling on the North and South Saskatchewan Rivers, and a continuation of foundation investigations for the Soil Mechanics Division at the Coteau damsite. P.F.R.A. also continued to operate the pre-development farm at Outlook. A brief description of the project is contained in P.F.R.A. Annual Reports for previous years.

In general, however, the proposal is to develop the waters of the South Saskatchewan River to irrigate some 500,000 acres of land in central Saskatchewan. The project would also provide for power development, flood control, stream flow regulation, urban water supply and recreation.



Irrigating a crop of potatoes on the pre-development farm at Outlook, Sask., as a field scale demonstration of what can be grown successfully under irrigation.

Ref # 2988

Survey work on the project commenced in 1943 to determine the feasibility of development. This fact has now been established from an engineering standpoint and sufficient information has been gathered to proceed with construction should it be decided to do so. In the meantime, further investigational work will be confined to making minor alterations and refinements to existing engineering plans and carrying on studies which are projects of a continuing nature.

#### Engineering Investigations

Silt sampling and stream flow records as well as gauge height measurements were taken regularly throughout the 1955 open water period on the North Saskatchewan River at Borden and on the South Saskatchewan River at Outlook. These hydrographic investigations were carried out in collaboration with the Winnipeg Regional P.F.R.A. Office, the silt sampling information being used by the Winnipeg Office in connection with sedimentation studies on the Saskatchewan River Reclamation Project.

Field survey work carried out during 1955 included tying in boreholes drilled under the supervision of the Soil Mechanics Division at the Coteau dam-site, and completing a survey of the shoreline and land surrounding Goose Lake. The Goose Lake survey was undertaken to provide data for a preliminary map of Goose Lake and surrounding area, and to compute the Lake's potential storage capacity. Goose Lake is considered as one of the proposed reservoirs situated on the west gravity irrigation distribution system.

Soil Mechanics investigations during 1955 consisted of drilling 24 boreholes in the vicinity of the Coteau damsite to complete sub-surface exploration in an area not previously drilled. Of the borings made 8 were special "slope-indicator" holes, in which special apparatus will be installed periodically to check sub-surface movement, if any. Several holes which had previously been drilled to a shallow depth and then abandoned because of extremely difficult drilling conditions, were re-drilled at slightly different locations and carried to a greater depth.

#### Pre-Development Farm

During the 1955-56 fiscal year construction work was completed to increase the bin capacity of the farm root-cellar from 100 tons to 300 tons. In addition the 100' x 200' farm dugout was lined with a new type of plastic lining in an experiment to determine its effectiveness in preventing seepage. Prior to lining, the side slopes of the dugout were changed from 1-1/2:1 to 3:1.

A close topographic survey was carried out as well on two of the farm's 12 acre fields in preparation for land levelling. A topographical map of the fields concerned was then sent to the Drainage Division of P.F.R.A. at Vauxhall who assisted in laying out the plan of construction for land levelling to be used.

The farm is set up in two parts. One part consists of 155 acres of land broken down into a 24 acre pasture area, ten 12 acre fields and 11 acres of farm-yard. This part is operated by P.F.R.A. as a full scale study in established farm practices and irrigation methods which should be followed if and when irrigation is introduced into the area. In addition, the purpose of the P.F.R.A. operated farm is to select irrigation techniques and practices best adapted to prevailing local soil and climatic conditions of the region. The other part of



the farm consists of a 16 acre plot of land across Highway No. 15 from the P.F.R.A. farm, operated by the Federal Experimental Station at Swift Current. Detailed experimental work is carried on in this latter 16 acre area. Valuable information is being obtained on all phases of irrigation farming.



Irrigation experiments being conducted on the pre-development farm at Outlook under the direction of the Swift Current Experimental Station. Ref # 4009

Water is delivered to both farms for irrigation by pumping from the South Saskatchewan River. Irrigation is planned so that approximately 60% of the area can be served by gravity means and 40% of the farm by overhead sprinkler method.

On the P.F.R.A. farm a ten-year grain with grass and legume rotation is planned on the cultivated land. The pasture area, divided into four 6 acre fields, has been seeded down to recommended mixtures of pasture grasses and legumes. Crop yields during 1955 showed progressive improvement over previous years as P.F.R.A. continued to follow its program of soil improvement through the use of fertilizers, manure and legumes. The relative production per acre of the various crops produced on the farm in 1955 were as follows:

<u>Crop</u>	<u>Acreage</u>	<u>Yield per acre</u>
Oats	11.0	51 bus
Wheat	12.2	32.8 bus
Barley	12.2	39 bus
Potatoes	12.0	12.5 tons
Hay	58.1	2.1 tons
Forage	21.8	1.3 tons



For most of the summer and fall season 42 bulls were carried on the farm's 24 acre pasture area for the P.F.R.A. Community Pasture Branch. Later in the fall, the bulls were replaced by 77 young bulls.

### Assiniboine River Diking

The object of the Assiniboine River Diking Project is to protect from damage valuable agricultural lands situated adjacent to the Assiniboine River between Portage la Prairie and Winnipeg which have been subjected to frequent flooding.

Prior to 1950 dikes constructed along the River to guard against flooding were built by the local farmers. The height of these earlier dikes was governed by previous experience with local high water conditions and consequently, no systematic program prevailed. In more recent years the Federal Department of Public Works assumed the responsibility of flood protection work along the Assiniboine River building dikes of a more permanent nature. In 1950 responsibility for the work was transferred to the Federal Department of Agriculture through P.F.R.A.

Construction work during 1950 under P.F.R.A. was confined to the so called Hoop-n-Holler cutoff east of Portage la Prairie. Limited funds during 1951 confined the work to the construction and repair of dikes requiring immediate attention. During 1952, the first major step in large scale dike construction was taken. In that year 7 miles of dike was constructed. The following year an additional 9 miles of new dike was built, along with 2 small river cuts, namely, Rivard and Abraham. Heavy summer and fall rains hampered work in 1954. However, another 11-1/2 miles of new dike was constructed.

In 1955 extensive flooding along the lower reaches of the Assiniboine River again delayed construction. Despite this delay it was possible, beginning in September, to complete the construction of an additional 10.4 miles of dike. A contract awarded in 1955 for the construction of Ross cutoff, located on the Assiniboine River near the town of Gervais, was completed in December 1955. In addition about 3/4 of a mile of miscellaneous diking works were completed near the town of Headingley.

### Assiniboine River Flooding - 1955

Heavy precipitation during the fall of 1954 combined with average snow-fall, plus a short melting period in the spring, produced a spring run off of above average magnitude. Ice jams on the Assiniboine River just downstream from Portage la Prairie and in the Poplar Point area caused flooding. In both cases, however, it was possible to drain off the overflow quickly and only minor damage resulted.

While these floods were receding, a very severe storm occurred over the western part of the drainage basin during the first three days of May. Flood waters from the Qu'Appelle and Assiniboine Rivers merged causing a pronounced rise in the level of water in the Assiniboine River. A peak of 19,000 c.f.s. was reached at Brandon on May 20th. Between Brandon and Portage la Prairie the peak was further increased by above average flow from the Souris River as well







as a local run off from heavy rains. A peak flow of 22,250 c.f.s. was recorded at Portage la Prairie on May 24th.



Flooding through a breach in an old section of dike on the Assiniboine River 6 miles east of Portage la Prairie on the farm of Mr. A. Ross during the 1955 spring runoff period.

Ref # 10591

It soon became apparent that some of the older dikes did not have elevation consistent with the flood profile and there was great danger of overtopping. At places sand bags were placed. However, rapid erosion of a section of old dikes on the farm of Mr. A. Ross, 6 miles east of Portage la Prairie, resulted in its complete collapse on May 22nd, 1955. Escaping water estimated to be in the neighborhood of 6,000 c.f.s. poured out over rich agricultural land adjacent to the River for a distance of several miles; as the flooding intensified it commenced to migrate southeast toward the LaSalle River. The overland advance of the flood waters proceeded at the rate of about 2 miles per day until the main force of the flood waters in the Assiniboine River had receded. The release of water through the break in the dike had a deflating effect on the force of the flood waters in the lower reaches of the Assiniboine River and consequently reduced the danger of other breaks occurring in the diking system.

For lack of sufficient river flow information the designing of dikes constructed by P.F.R.A. prior to this year had been based on the top elevations of existing dikes which had withstood previous floods. Geodetic elevations were carried along the River and the elevation of these dikes was established. In most cases this method proved satisfactory. However, the 1955 flood provided an excellent opportunity to obtain detailed information from which an accurate



high water profile could be established. After all hydrometric data had been plotted the future design elevation of dikes was recommended and established on the ground.

### Riding Mountain Reclamation Project

Work is currently being carried out on this project under the terms of a joint agreement between the Government of Canada and the Province of Manitoba. A number of streams and rivers flowing off the northern and eastern slopes of the Riding Mountain give rise to serious flood problems on surrounding farm land involving an area of over 252,000 acres. Extensive investigations have been carried out to devise a plan to relieve the lands affected by flooding, followed by a program of construction. All construction costs are borne jointly between the Government of Canada and the Manitoba Government.

#### Surveys

Topographical surveys were conducted in the Turtle River basin, and on Garland Creek during the 1955-56 fiscal year for the purpose of re-evaluating earlier proposed solutions to the flooding problems in these areas and to formulate specific plans for reclamation.

A flood damage survey started in 1954 was continued in 1955 until June. This study was undertaken in order to evaluate as accurately as possible the economic consequences of the 1953 flood in the Riding and Duck Mountain area of Manitoba. It was carried out in three steps; a preliminary survey, farm to farm enumeration and the evaluation of data collected. At least 50% of all farmers affected in each watershed were visited and a careful inventory was made of all losses pertaining to the 1953 flood which were recorded. The actual field work analysis was completed on June 1, 1955, as stated earlier. A report on the findings of the survey was prepared and submitted to P.F.R.A. headquarters in August of the same year. Results of the survey indicated that during the 1953 flood in the Riding and Duck Mountains flood damage amounted to \$3,400,000.00 with 169,547 acres being flooded and 6,800 acres affected by erosion or sedimentation. Damages ranged from \$1,580.00 per quarter section for a whole township to a value approaching zero.

#### Construction

No entirely new construction was undertaken on the Riding Mountain Reclamation Project during the year. Work done was confined to improvements on drainage projects previously completed. Improvement projects undertaken involved works on Wilson River and Edwards and Mink Creeks.

### Buffalo Pound Lake Project

Development of the Buffalo Pound Lake Project by P.F.R.A. was undertaken at the request of the Federal Government in order to fulfill assurances made to the Province of Saskatchewan in 1948 that adequate water supplies would be made available in Buffalo Pound Lake for use by the City of Regina and other

urban centres in Saskatchewan. The commitment was made following receipt of representations made by the cities of Regina and Moose Jaw for permission to use Buffalo Pound Lake as a source of urban water supply. Canada's participation in the water supply project was approved on the basis that the proposed undertaking was an integral part of the overall plan for development of the South Saskatchewan River, then currently under consideration. Assurance of an adequate water supply in Buffalo Pound Lake would involve the construction of works for diverting water from the South Saskatchewan River to the Qu'Appelle River by pumping, and channel improvement along the course of the Qu'Appelle River to Buffalo Pound Lake. This, coupled with an attempt to increase the effective use of local run off in the Qu'Appelle River basin and Moose Jaw Creek with the creation of additional storage facilities, constituted the overall approach to the water supply problem.



Canal Construction between Pumping Station #1 and  
Pumping Station #2 on the Buffalo Pound Lake Project.  
Ref # 10638

Survey work completed during 1955-56 included locating approximately 6 miles of canal to be built in 1956 for diverting the Qu'Appelle River around the north side of Eyebrow Lake. A profile of the bed of the Qu'Appelle River and of the bottom of Eyebrow Lake covering a distance of about 15 miles, was also completed from the point where Ridge Creek joins the Qu'Appelle Valley to about 2 miles downstream from the lower end of Eyebrow Lake. Finally, the usual offset control lines and bench marks were established to guide construction on Contracts 2 and 3.

Construction during the year included work on 3 contracts, and channel improvement work accomplished by P.F.R.A. using Government owned and hired equipment.

Construction of 9.7 miles of canal from Pumping Station #2 to the summit of the Qu'Appelle Valley, under Contract #1, was completed on October 15, 1955.

Work on Contract #2, involving the construction of 2.5 miles of canal and appurtenant works between Pumping Station #1 and Pumping Station #2 was barely started at the time of the early freeze-up in November and work had to cease.

Similarly, early freeze-up prevented completion of work under Contract #3 covering the construction of 3 miles of channel and appurtenant works between Summit and the point where Ridge Creek joins the Qu'Appelle Valley. At cessation of work for the season approximately 70% of the contract had been completed.

Contract #4, involving the construction of a conduit to carry 120 c.f.s. of water under the large C.P.R. fill crossing the Qu'Appelle Valley near Aiktow, was let in December 1955, but construction did not actually start until April 4, 1956.

P.F.R.A. construction activities centred around Eyebrow Lake. About one-half mile of pilot channel, 3 feet deep and 8 feet wide, was excavated by ditching dynamite from the edge of the permanent bed of the Lake down to Eyebrow Lake road crossing. This pilot channel enabled the excess water in the Lake, above its normal capacity, to drain off quickly so that machinery could work in the area. A hired dragline widened the pilot channel to 50 feet.

Dragline spoil banks along the portion of the Qu'Appelle River deepened and cleaned the previous years, were flattened and shaped with a hired tractor, with bulldozer and blade grader. These spoil banks were then seeded to crested wheat grass.

### British Columbia Projects

The fiscal year 1955-56 saw the completion of a co-ordinated program of land development and reclamation sponsored jointly since 1949 between the Provincial Government of British Columbia, the Veteran's Land Act and the Federal Government. Since the inception of this program P.F.R.A. has built 9 irrigation projects, one reclamation project and 1 wildlife conservation project. Of the 9 irrigation projects, 7 were built for the V.L.A. to provide small holdings or full time farming units for the settlement of war veterans. The total area developed for this purpose amounted to 2,788 acres. The land for the projects is subdivided into appropriate sized lots for the settlement of over 300 veterans. The remaining 2 irrigation projects were undertaken to bring water to lands owned by Experimental Stations of the Experimental Farm Service, to be used for research purposes. Land reclamation activities involved the development of flood control works and drainage along streams entering and flowing through the Lillooet Valley to bring into production some 14,000 acres of good farm land previously inundated by flood waters.

In conjunction with this work the Government of Canada has continued to make available P.F.R.A. engineering services to carry out surveys and other special engineering investigations required by the V.L.A., the Government of British









Columbia and in more recent times the Fraser River (Federal-Provincial) Board, in connection with other proposed irrigation, reclamation and watershed development projects.

Specifically, the activities of the P.F.R.A. in the Province of British Columbia during 1955-56 have involved investigation of new Veteran's Land Act projects, supervision of operation and improvement on projects already constructed for the Veteran's Land Act and other agencies, the improvement and investigation of special projects sponsored by the Government of British Columbia and the Federal Government, and damsite, topographic and geological investigations in connection with water storage and power proposals on the Fraser River watershed for the Fraser River Board.

## PROJECT OPERATION AND IMPROVEMENT

### Cawston Benches Project

On this project situated on river bench lands, 3 miles south of Keremeos, B.C., P.F.R.A. crews effected permanent repairs to the irrigation and domestic water supply intake. The intake located on the bank of the Similkameen River consists of 4 deep-well turbine pumps designed for combined capacity of 5,100 U.S. gallons per minute. Excessive leakage during previous high water periods had permitted large quantities of silt to accumulate to materially reduce operating efficiency.

### Johnston Western Canada Ranching Project

To meet the heavy demand for irrigated small holdings in the Kamloops district, P.F.R.A. undertook to re-subdivide a portion of the Johnston Western Canada Ranching Project which had been built earlier and to convert the existing gravity system of irrigation into a pressurized system. Water is now pumped from the South Thompson River by means of 2 vertical turbine pumps and motors through 13,000 lineal feet of asphalt coated and wrapped 4 inch to 10 inch steel pipe. Automatic control has been provided so that domestic as well as irrigation water supply can be drawn from the river at all times.

### Penticton West Bench Project

Only minor adjustments to the water supply system serving the Penticton West Bench Project were necessary in 1955. This project, completed in 1953, consisting of 205 acres divided into 94 holdings, is situated immediately west of the City of Penticton, B.C. on high bench land overlooking Lake Okanagan. Water for domestic as well as for irrigation purposes is pumped from the Okanagan River, a vertical distance of 450 feet. P.F.R.A. has continued to maintain supervision over project operations to ensure that the system of irrigation is functioning efficiently. Settlement of the project was completed by September 1954.

### Westbank Project

Assistance was given on this project to instal a new metal flume to replace a lined section of sidehill which has been weakened by the constant passage of wild game. It would appear impossible to deter game from using this area as a



Contract #5 - This contract covering the construction of an intake on the South Saskatchewan River, and 2 pumping plants, was commenced in 1956 and was about 55% completed by March 1957.

Other construction on the project consisted of the widening and cleaning of about 2 miles of Qu' Appelle River channel below Eyebrow Lake, flattening and shaping spoil banks along the Qu' Appelle River, and seeding of crested wheat grass on 2 miles of canal banks and waste areas on Contract #2, and the borrow pit area on Contract #1.

### Saskatchewan River Reclamation Project

Between Tobin Rapids in Saskatchewan, and The Pas in Manitoba, the Saskatchewan River has formed a large, marshy delta. It has been estimated that this region, now under study by the Saskatchewan River Reclamation Project, contains approximately 1.5 million acres of potentially arable land. The 135,000 acre Pasquia Area, presently being developed southwest of The Pas, is expected to yield about 100,000 acres of arable land. For purposes of description, the portion of the project lying outside of the Pasquia Area is referred to as the Sipanok Area.

#### SIPANOK AREA

Topographic surveys on various streams through the Sipanok Area were continued this year. Hydrometric surveys, pertaining to the discharge of water and sediment into and through the delta between Tobin Rapids and The Pas, were also carried out. In addition, bathymetric surveys were completed on ten sections of the Saskatchewan River, as well as on the whole of Cumberland Lake. All these surveys are necessary parts of the investigation program required before engineering plans for possible reclamation work can be formulated.

#### PASQUIA AREA

##### Surveys

During 1956 the survey work in this area consisted of establishing lines and grades for the construction of eleven miles of dikes, twenty-five miles of drains and a pumping plant.

##### Operation

The Diversion Dam on the Pasquia River upstream from The Pas diverts the flow of the Pasquia River into the Carrot River drainage system. The Pasquia River channel below this dam now serves as a drainage canal for the Pasquia Project. Between July 12 and freeze-up, 1956, approximately 400,000 acre feet of water was discharged through the Control Dam at the outlet of this canal.



holdings adjacent to the Goat River. A P.F.R.A. report on investigations was completed on this project three years ago but was withheld until 1955 pending completion of land appraisal surveys.

#### Fraser River Board

For the past three years P.F.R.A. has made available its engineering services to the Fraser River Board which is charged with evolving a plan for power development on the entire Fraser River system and integrating with this, flood control protection. Early in 1955 a P.F.R.A. report was finalized for the Board's consideration on the structures required to provide a flood control reservoir on Harrison Lake. These proposals would involve several million dollars and examination of structure requirements was in sufficient detail to provide a preliminary cost estimate.



Members of survey party chaining northend base line at Hobson Lake in connection with investigational work being carried out by PFRA for the (British Columbia) Fraser River Board. Ref # 10636

The more current and major part of the year's work was a continuation of two years of investigations on the Clearwater River, a tributary to the Thompson River stem of the Fraser, located 120 miles north of Kamloops; and on the McGregor River, a large tributary to the Fraser 20 miles east of Prince George. The McGregor site will provide up to 4,000,000 acre feet of storage; 1,000,000 of which can be made available for stream regulation. A conservative estimate of the horsepower potential from the McGregor River sites is 175,000.

## ENGINEERING SERVICES

For many of its projects P.F.R.A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is seldom available from outside sources, the organization has set up a number of Divisions under the general heading of Engineering Services.

### Hydrology Division

This Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P.F.R.A. projects. In general, the studies undertaken may be classified under three headings: flood potential determinations, water supply and utilization studies for specific projects, and water supply and utilization on broad watershed bases. In addition, the Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies, provides information for the Canadian section of certain international engineering boards established under the International Joint Commission, and does minor studies of varying character for other Branches and Divisions of P.F.R.A.

During the 1955-56 fiscal year, the flooding potential at many proposed damsites was studied and reported upon, and water supply studies were undertaken for a number of specific water development projects including several in the Qu'Appelle, Frenchman and Souris River basins.

General watershed studies have been continued in 1955, in order to present an overall picture of future water supply and utilization in selected drainage basins. Studies of this character which have been undertaken and were completed this year are as follows:

Hydrology Report #9,	"Water Supply and Utilization in the Bow River Watershed", September 1955(completed)
Hydrology Report #11,	"Water Supply and Irrigation in the Frenchman River Basin", December 1955(completed).
Hydrology Report #12,	"Qu'Appelle Basin Floods of 1955", October 1955, (completed).
Hydrology Report #13,	"Water Supply and Irrigation in the Deer and Miner's Creek Basin", December 1955(completed)
Hydrology Report #14,	"Water Supply and Utilization in the Brightwater (Beaver) Creek Basin, Saskatchewan", March 1956 (completed in collaboration with the Moose Jaw District Office).
Hydrology Report #	"Water Supply and Utilization in the Wascana Creek Basin", (nearly complete).

Hydrology Report #

"Water Problems in the Kipling Marsh Watershed" (to be undertaken in collaboration with Air Photo Analysis Division).

Hydrology Report #

"The Qu'Appelle River Watershed - Droughts and Floods", (to be undertaken in collaboration with other P. F. R. A. Divisions).

Additional studies of various character were supplied throughout the year to the Prairie Provinces Water Board. In addition, studies were undertaken for the Canadian Section of the International Souris-Red Rivers Engineering Board for the International Joint Commission, with particular emphasis given to possible future developments within the Souris River basin. The Division also carried out snow surveys to forecast the spring run off volumes in connection with the operation of Buffalo Pound Lake in the Qu'Appelle Valley, and again gave assistance to the Swift Current Experimental Station in the operation of their Davin Hydrology Research Station. A special effort was made throughout the spring and summer to observe and record the physical characteristics of the flooding in the Qu'Appelle Valley in order to provide information for operating procedures and studies in line with P. F. R. A. responsibilities in that area.

### Surveys Division

Survey work plays an essential and major role in the P. F. R. A. planning program by providing field data relating to the location, design and construction of projects. P. F. R. A. surveys may be divided into two groups; legal surveys and engineering surveys.

#### Legal Surveys

Due to wet spring and early winter the field season was shorter than usual. However, quite extensive surveys were undertaken and completed during 1955. Seven field parties, two in Saskatchewan and five in Alberta, were employed throughout the summer on this work.

The two Saskatchewan parties completed the following work:

1. Right-of-way of Pike Lake located in the Saskatoon District.
2. A re-survey of a major portion of Buffalo Pound Lake including right-of-way survey of the Sun Valley Subdivision.
3. Subdivision and parcel surveys at Eagle Lake and Swift Current for the Community Pastures Branch.
4. Surveys of access roads to the Pipestone and Kaposvar Reservoir were also completed.
5. Work was started on the canal from Saskatchewan River to Buffalo Pound Lake together with the subdivision and right-of-way surveys of the southerly and easterly boundary of Rush Lake in the Swift Current Irrigation District.

In Alberta three parties working on the Bow River Project completed 23 miles of main canal right-of-way, 1 mile of lateral canal right-of-way, and 40



miles of perimeter measurement on reservoirs as well as one parcel survey and 65 parcels of subdivisions covering 6,180 acres. Another two parties working on the St. Mary Project surveyed 112 miles of canal lateral right-of-way and 2 miles of road.

Five employees of the Legal Surveys Branch are articling to become Land Surveyors and are in various stages of writing preliminary and final exams for Dominion, Alberta and Saskatchewan Land Surveyors Commission.

#### Engineering Surveys

An active survey program was carried out by the Engineering Services Branch during 1955 involving both structure surveys and construction surveys.

In connection with the proposed Red Deer Irrigation scheme in Alberta survey work concerning the possibility of diverting the Clearwater and North Saskatchewan Rivers into the Red Deer River was continued. Also further investigations into the possibilities of conveying this water into Saskatchewan were made.



Engineering Surveyor shooting levels. Ref # 2882

Further details of engineering surveys carried out during the past year are discussed along with the individual projects concerned.

#### Soil Mechanics and Materials Division

The Soil Mechanics and Materials Division carries out studies and provides technical advice in connection with foundations, soils, concrete and other materials associated with earth dam and water development projects. In the investigational stage this involves field exploration, sampling, testing, design



studies and reports. Such work provides the basic information required to enable designs to be drawn up and estimates to be computed. In the constructional stage further detailed exploration is required along with construction control, additional testing and installation of special test apparatus. With the project in service the test apparatus is utilized to indicate the performance of the structures and to insure that seepage or deformation does not exceed tolerable limits.

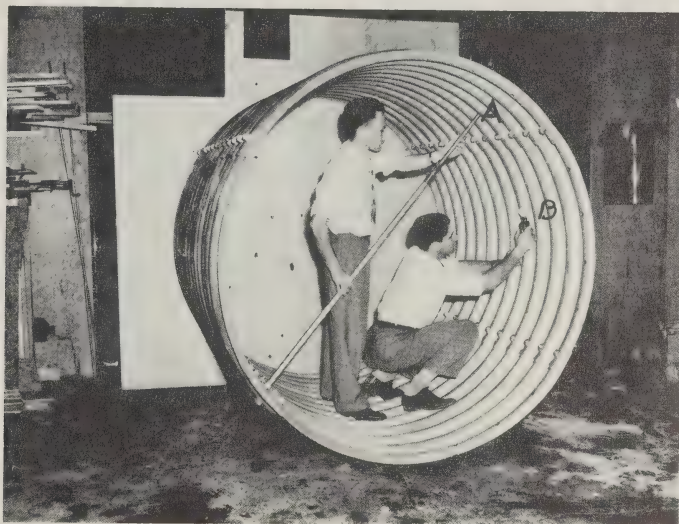


Drilling operations being conducted by members of the Soil Mechanics Division's field staff using the hand operated washbore type equipment. Ref # 10551

During the past year all the exploration units operating at some 39 projects or sites drilled approximately 50,000 feet and 15,000 samples were recovered. Major sites investigated included Waterton Damsite No. 3 which will require a 200 foot high earth embankment, Fifty Mile Damsite, Boundary Damsite and continued exploration at the South Saskatchewan River Damsite. In order to carry out this work the Division has 6 power driven truck or trailer mounted units in use on projects where deep hole drilling and sampling are required. For test holes 50 feet in depth or less, however, the rather simple apparatus known as a washbore outfit is most commonly used. While operation of this (hand) unit sometimes requires a great deal of perseverance it is particularly adaptable to small damsites where topography and other conditions make movement of the heavier truck mounted units difficult or impossible.

Technical advice and field testing of soils and concrete have been provided on most of the earth and concrete projects described elsewhere in this report.

A new field of work was encountered by the Division when concrete control and inspection services were provided in connection with making 6 inch concrete drainage tile for the Rush Lake Section of the Swift Current Irrigation Project. Aggregates were located and tested and suggestions as to manufacture and curing of the tile were made. Strength and absorption tests were performed on representative samples of the tile at the Saskatoon Soil Mechanics Laboratory.



Testing the potential strength and load carrying capacity of a metal conduit to be used for river diversion purposes.

Ref # 10550

In order to study conditions peculiar to water development in western Canada, practical research projects on the following are being carried out on a continuing basis: high plastic clays, clay shales, canal lining materials, western concrete aggregates, local cements, concrete repair and winter concreting.

In addition to the above a new research project involving studies pertaining to flexible metal conduits was initiated by the Division during the year. The Design Division proposed the utilization of temporary metal conduits for river diversion on the South Saskatchewan River Development Project and other projects. While this type of structure, in the form of culverts, has been used extensively for many years most of the available information pertains to durability and length of life whereas for river diversion purposes these factors are of secondary importance. Stability during a limited period of use must be the prime consideration. The present studies, therefore, are aimed at determining the strength and load carrying capacity of metal conduits, particularly in clay soils. Measurements are being taken on four installations in the Prairie area.

Stresses and diameter changes in the structure are a primary concern, and deformations in the surrounding soil caused by load application are carefully studied. The illustration in reference number A10550 shows a diameter or girth gauge (A) which is being utilized to measure the change in diameter of a test culvert as an embankment is constructed over it. In the same illustration is shown a Whittemore Strain Gauge (B) which measures strain in a 2 inch gauge length of the culvert, from which stress in the metal can be computed.

### Air Photo Analysis and Engineering Geology Division

The Air Photo Analysis and Engineering Geology Division makes air photo interpretations of geology, soil characteristics, topography, drainage and cultural use of the land to facilitate the survey, exploration and design of P.F.R. A projects.

In 1955 the Air Photo Analysis and Engineering Geology Division carried out surveys and investigations for further development of agricultural lands in the three prairie provinces. In addition two special studies were made - one for the British Columbia Fraser River Board and one for the Ceylon Government.

Major activities of the Division were preliminary dams site studies involving air photo interpretation and follow-up field investigations. Such studies were made on 12 dams sites in the three prairie provinces and outlined general topographic suitability, anticipated foundation and abutment conditions, and location of construction materials.

For the Canadian Section of the International Souris-Red River Engineering Board, the Division made an air photo study of the Souris River drainage basin and presented a map outlining contributing and non-contributing drainage areas in the basin. A similar watershed study was carried out for Kipling Marsh, Saskatchewan.

Two projects relating to irrigable lands were completed. Air photos and agricultural soil maps were employed in the first project to locate all potentially irrigable land in the prairie provinces. The other pertained to irrigable land in the Hays area, Alberta, and related geologic environments of soil origin with irrigation soil rating.

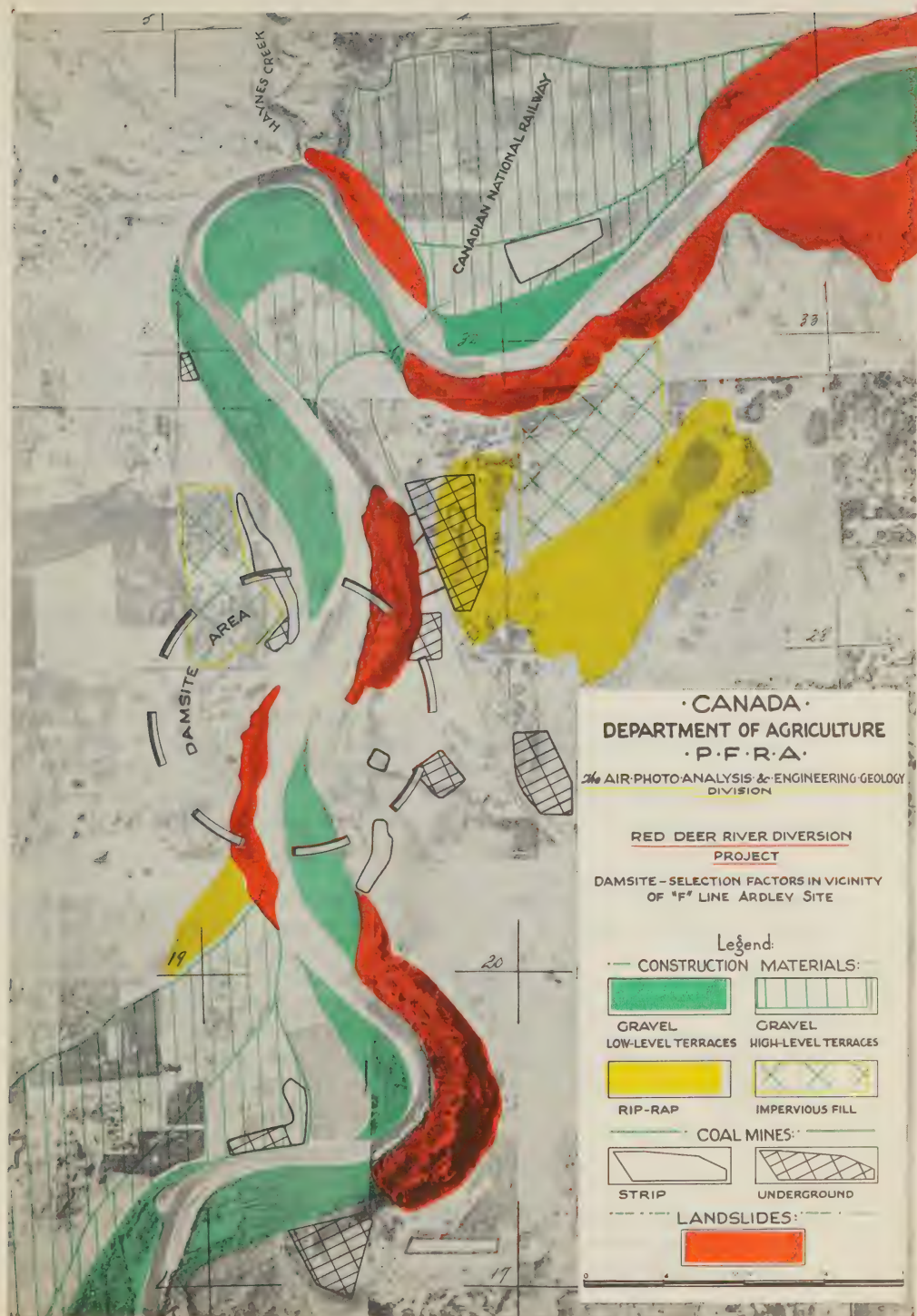
An air photo study of the entire Assiniboine River system was initiated in 1955 and will determine all locations suitable for flood control dams and storage reservoirs.

A number of air photo studies relating to land erosion, groundwater, reclamation, flooding, river diversion, abutment stability and location of construction materials were completed. These studies were located throughout Manitoba, Saskatchewan and Alberta.

Studies for the British Columbia Fraser River Board presented air photo appreciations of 15 potential dams sites on the Fraser, McGregor, Moose, Angus-horne, Clearwater and Nechako Rivers; eight of these sites received follow-up field investigations.

Work for the Ceylon Government was carried out under auspices of the Colombo Plan and advised on possible uses of aerial photography in furthering development of Ceylon's natural resources.









## Design Division

The Design Division is responsible for all major engineering planning and design work for all P.F.R.A. divisions and services. The work is performed with:

P. F. R. A. Engineering Field Offices - who supply survey and other engineering field information on proposed projects.

Soil Mechanics and Materials Geology Division - who provide the technical advice on foundations, soils and concrete.

Air Photo Analysis and Engineering Division - who provide information on surface deposits, land use suitability, historical geology of project sites and such other data as may be obtainable from aerial photographs, corroborated by actual field investigations.

Hydrology Division - who make studies pertaining to flood flows and frequency, routing floods and spillway capacity.

The engineering success of water carrying structures is also heavily dependent upon information gathered in regard to the hydraulic behaviour of structures obtained from scale model testing under actual flow conditions. For this purpose, the Design Division operates a modest, but well equipped hydraulic laboratory located in Regina.

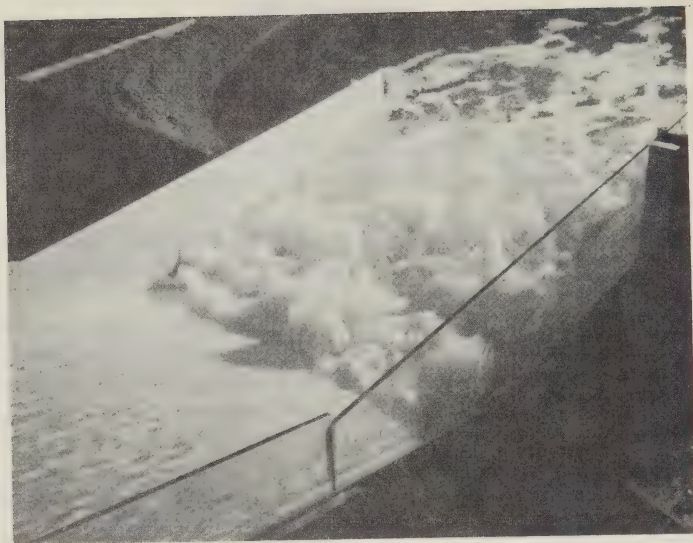
During the 1955-56 fiscal year, the Design Division provided the engineering services on the Bow River Project for development work currently being carried out by the Province of Alberta. This work included engineering planning, investigation and design, preparation of specifications for construction and preparation of construction materials lists in suitable form to be used for actual ordering.

On P. F. R. A. undertakings, the Design Division handled 24 major construction contracts from the design stage to the awarding of a contract. The contract value of this work amounted to \$3, 130, 000.00 and required the preparation of 157 large sheets of drawing.

Models of structures tested in the hydraulic laboratory during the fiscal year included the Belly River Weir, the outlet conduit from McInerney Dam, Davin Weir and Taylor Coulee Chute. In addition, general hydraulic studies were continued with the use of models in connection with the behaviour of drop inlet pipe spillways, hydraulic jump characteristics on the 4 to 1 sloping chutes and radial gate checks.

## Drainage and Reclamation Division

A growing saline problem on irrigated soils in western Canada is becoming apparent not only on P. F. R. A. projects but on other private and government owned projects as well, causing serious damage to land in some areas and a



Model testing hydraulic jump characteristics of chute drop structure when discharging at full capacity.

Ref # 10634

substantial reduction in crop yields. P.F.R.A. has, therefore, organized a division of work to thoroughly investigate and find solutions to these problems on P.F.R.A. projects where settlement has taken place, and to recommend measures that would ensure that salinity problems will not develop on future projects built by P.F.R.A.

Experience has shown that the majority of the salinity problems on irrigated land have resulted from not having adequate drainage. In irrigating western soils which are naturally high in salt content with water that may contain varying amounts of salt, it is inevitable that salt concentrations will build up in the root zone of the soil. Some excess irrigation is a prerequisite to leach away the salts, and drainage is necessary (both surface and sub-surface) to remove the excess irrigation water. In fact, there are practically no irrigation soils which have sufficient natural drainage to remain permanently irrigable under normal irrigation practice, and it is essential that all proposed developments be investigated to determine the amount and kind of drainage required and that drainage and reclamation costs will be economically feasible in relation to the value of the crops to be produced.

The Drainage and Reclamation Division has been actively engaged in this work since 1949. Activities during the 1955-56 fiscal year included the carrying out of investigations, new construction and reclamation work on the Bow River and St. Mary Irrigation Projects; drainage investigation and reclamation work on 5 projects owned and operated by the Government of Canada in



Tile laying operations through a difficult high water table area on the Bow River Irrigation Project.

Ref # 4191

southwestern Saskatchewan; and the study of a number of special irrigation and drainage problems to test the applicability and efficiency of new and improved techniques in drainage and reclamation evolved by research institutions in Canada and the United States of America.

#### Bow River Project

Preliminary surveys to determine the soil drainage characteristics covering two large tracts of land proposed for irrigation on the Bow River Project totalling 70,000 acres were completed by the Drainage and Reclamation Division in 1955. In addition, the Division carried out land classification surveys to establish soil ratings in relation to suitability for irrigation on 32 quarter-sections of land in the Hays area intended for settlement of new irrigation farmers. On the older established sections of the project 30 quarter-sections of land were surveyed to determine the extent and degree of salinity, and to make recommendations for improving drainage or to reclassify as non-irrigable land.

Construction work carried out under the direction of the Drainage and Reclamation Division on the Bow River Project included the installation of 30,750 feet of tile drainage as well as completion of land levelling operations on 335 acres of land in the Hays area in preparation for settlement.





Spreading a 130 foot x 70 foot Polyethylene liner for a dugout in the Vauxhall district of the Bow River Irrigation Project in an experiment to determine its effectiveness in preventing seepage. Ref # 3947

The procedure of levelling has been greatly improved by the Division in recent years involving new techniques in planning and design. The present method permits construction work to be carried out with a minimum of earth moving. Assistance was made available to 24 farmers at cost in the Vauxhall district to improve the efficiency of their present system of irrigation by land levelling using the improved procedure.

The development of an area of 5,000 acres of land south of Hays locally called "Windmill Flats", which is being considered for development involves a special drainage problem. Since the area is predominately deep sands with a natural high water table, special care in handling is necessary. A test plot of this land of about 50 acres was levelled and seeded to fall rye in 1955. A tile drain was also constructed in the development area. The test will consider the possibility of utilizing the natural high water table in the area together with controlled drainage to provide for sub-surface irrigation.

#### St. Mary Irrigation Project

Preliminary investigations and reports were completed in 1955 in connection with several seepage areas along the St. Mary Irrigation Project main canal in the Meek-Hutterite, Koppenstein and Grassy Lake districts. Some additional information has still to be gathered and a final report with recommendations should be available early in 1956.

In addition, a drainage problem on the Lethbridge Experimental Farm was investigated and recommendations for control were submitted.

#### Cypress Lake Storage Project

Portions of privately owned hay meadow below the east and west dams on Cypress Lake Reservoir have developed into problem areas due to canal and reservoir seepage. Drainage from both areas is particularly difficult due to the lack of natural slope. Problems on both areas are being studied and recommendations for control of seepage will presently be completed.

#### Consul Irrigation Project

Construction of a tile drain along the McKinnon canal, north of Consul, which was started in 1954, was completed in 1955. Early indications are that the tile line will be effective in controlling canal seepage which has contributed to a general buildup of the groundwater table in that area.

Recommendations for a tile drain from an area along the south part of the Village of Consul were submitted early in the year. Some surface drainage was completed by project personnel. No work on the proposed tile drainage system is contemplated until results of the surface drainage can be assessed.

#### Swift Current Irrigation Project

Approximately 23,000 feet of tile drain was laid by contract in the Rush Lake Irrigation District during 1955 to reclaim a saline area along the eastern fringe of the irrigated area. This area constitutes a valuable asset for a safe feed supply to farmers in the event of drought and at present is being leased by farmers from the Government of Canada for hay production.

#### McInerney Irrigation Project (Govenlock Community Pasture)

A soil survey was made in several community pasture areas near Govenlock to determine suitability for irrigation development. Results of the survey indicated that approximately 400 acres of land on the proposed project would be suitable for irrigation. The purpose of this project is to irrigate pasture in order to increase the carrying capacity of the Community Pasture.

#### Groundwater Study

The Drainage and Reclamation Division continued to maintain groundwater fluctuation records on all P.F.R.A. irrigation projects in order to be forewarned of any possible new drainage problems developing. Recording the measurements is being handled by project forces. The results are gathered and correlated by the Drainage Division and reported for necessary action to be undertaken.

#### Canal Lining Studies

As a result of investigations by the United States Department of Agriculture (Agriculture Research Services), P.F.R.A. has undertaken a program for field testing of various types of canal linings. Polyethylene plastic, a new material in Canada, was installed in a test section of a lateral on the Bow River

Project and in 2 dugouts. Installations were made jointly by the Drainage Division and the Soil Mechanics Division. Using the material as a buried membrane, early results have been encouraging.

#### Structure Calibration

In co-operation with the Hydraulics Section of the P. F. R. A. Design Division, a program of calibrating various typical structures in use on irrigation projects was undertaken in 1955. A measuring weir calibrated with more precise measuring devices has been developed for use in the study.

#### Farm Use of Water Studies

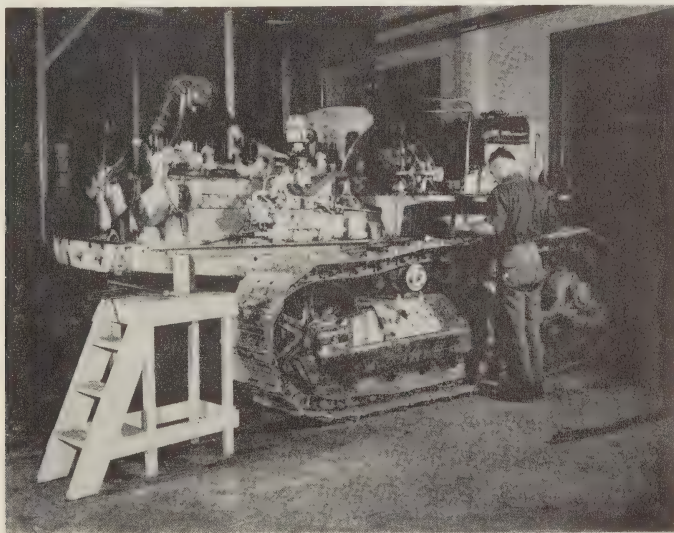
A program of measuring the water use on various representative farms on the Bow River Project was continued in 1955. A total of 12 farms were studied, including 2 farms on which land levelling had been carried out, to determine the effect of land preparation on improving irrigation efficiency.



## CONSTRUCTION, EQUIPMENT AND SUPPLY DIVISION

P.F.R.A. owns, operates and maintains certain types of specialized equipment for the carrying out of land and water development work which local businesses cannot be expected to undertake for reasons of cost, inaccessibility of the job or lack of suitable equipment. P.F.R.A. also employs personnel of special skills and supervisory ability to operate and maintain the equipment and handle the actual building of such works and structures. The main function of the Construction, Equipment and Supply Division is then to provide these various services.

The overhaul and repair of mechanical equipment and motor vehicles is carried out at Moose Jaw where workshops manned by experienced tradesmen are provided for the purpose. Most of this work is done during winter months when a number of men who would otherwise be only employed during summers can be used to advantage to assist the regular staff. Field repairs required during the summer are done by the basic staff. In addition to actual repair work the facilities at Moose Jaw are used for fabricating steel for field jobs and modifying or developing equipment for particular applications.



An extra large D8 caterpillar tractor receiving a complete overhaul in the PFRA workshops at Moose Jaw.

Ref # 3282

A small staff of carpenters are also employed in the Moose Jaw shops building concrete forms, camp trailers, water troughs for community pastures and other carpenter and joining jobs.



Local specialty trade shops are employed whenever possible to keep the purchase of special shop equipment and technicians to a minimum. This, of course, is not always possible and other trades such as machinists, electricians and painters are represented on the staff at Moose Jaw to supplement the work of the mechanics and carpenters.

During the past year, 46 different field jobs were done by crews of the Construction, Equipment and Supply Division. The jobs range from tractor work involving one man and his tractor for a few days, to replacing a concrete outlet structure through a dam in Cypress Lake. The cost of the various jobs ranged from as little as \$118.00 for repairing an irrigation check structure on the Maple Creek Irrigation Project to over \$46,000.00 for replacing the outlet structure through the west dam on Cypress Lake. In this work the Division's chief merit is the ability to get a job done no matter how small, unusual or distant and in which it would be difficult or impossible to interest local contractors.

# APPENDIX I

## Cumulative Statement

Development and Operation of Community Pastures under the Prairie Farm Rehabilitation Act  
1938 to March 31, 1956

Fiscal Year	No. of Pasture Units in Operation	Area of Pastures in Operation (Acres)	Total cost of Construction of Pastures in Operation \$	Livestock Units Carried on Pastures	X Acres per Unit of Live-stock	Cost of Operation		Net Operating Cost per Unit of Livestock \$	Average Charge per Unit Live-stock to Farmers \$
						Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,712,420	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
						3,980,412.31	3,500,637.07		

X - A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

# APPENDIX II

P. F. R. A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1955-56

Community Pastures and Headquarters	Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1955	Accumulated Cost of Construction March 31, 1956	1955-56	
				Stock Pastured Cattle	Horses
Pasture Operating Units - Saskatchewan					
Coalfields #4, North Portal	25, 440	109, 640. 14	129, 619. 28	2, 276	34
Estevan - Cambria #5 - 6, Macoun	6, 720	14, 246. 95	14, 246. 95	546	2
Masefield #17, Orkney	33, 440	83, 696. 81	86, 196. 81	1, 554	8
Lone Tree #18, Bracken	32, 900	70, 873. 39	72, 061. 39	2, 489	22
Battle Creek #20, Divide	66, 880	108, 918. 47	109, 469. 56	2, 331	16
Nashlyn #21, Consul	61, 520	68, 427. 87	69, 767. 87	1, 823	--
Govenlock #22, Govenlock	65, 280	87, 835. 91	94, 250. 93	2, 191	--
Lomond #37, Pasture #1, Goodwater	23, 360	55, 538. 34	60, 739. 60	1, 650	30
Lomond #37, Pasture #3, Maxim	18, 400	65, 261. 01	65, 755. 14	1, 637	30
Laurier #38, Lomond #37 - #2, Radville	37, 120	69, 147. 67	74, 920. 62	2, 866	52
The Gap #39, Hardy	12, 000	38, 955. 62	43, 001. 67	1, 243	12
Val Marie #47, Val Marie	156, 160	238, 843. 87	248, 271. 87	6, 086	9
Beaver Valley #47A, Val Marie	11, 360	23, 956. 95	23, 956. 95	641	--
Reno #51, Pasture #1, Robsart	16, 160	52, 222. 19	56, 188. 94	1, 136	11
Reno #51, Pasture #2, Consul	11, 440	26, 150. 16	28, 197. 48	786	4
Tecumseh #65, Forget	18, 560	56, 436. 34	60, 599. 00	2, 183	25
Brokenshell #68, Pasture #1, Yellow Grass	21, 120	45, 379. 85	45, 814. 59	1, 564	32
Brokenshell #68, Pasture #2, Weyburn	8, 160	13, 583. 47	13, 583. 47	578	11
Excel - Key West #71 - 70, Kayville	30, 400	69, 127. 73	70, 038. 16	2, 978	65
Auvergne - Wise Creek #76 - 77, Ponteix	41, 920	111, 893. 89	112, 613. 89	2, 664	7
Wellington #97, Tyvan	25, 680	87, 213. 00	94, 512. 13	3, 065	40
Caledonia - Elms thorpe #99 - 100, Milestone	24, 800	97, 951. 87	103, 524. 12	2, 163	48
Shamrock #134, Shamrock	26, 080	72, 024. 08	75, 099. 93	2, 174	--
Swift Current - Webb #137 - 8, Beverly	18, 720	75, 074. 77	76, 214. 77	1, 509	11
Gull Lake #139, Tompkins	10, 720	28, 745. 95	30, 189. 71	542	--
Big Stick #141, Maple Creek	17, 820	40, 751. 77	40, 929. 03	1, 303	--
Bitter Lake #142, Maple Creek	34, 120	90, 123. 29	109, 504. 42	2, 371	--
Spy Hill #152 - Ellice, Welby	40, 660	50, 399. 64	50, 399. 64	2, 569	23

Community Pasture and Headquarters	Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1955	Accumulated Cost of Construction March 31, 1956	1955-56	
				Stock Cattle	Pastured Horses
Pasture Operating Units - Saskatchewan - Cont'd.					
Elbow #223 - 4, Elbow	29, 440	73, 876.31	74, 779.63	2, 030	70
Beaver Hills #245 - 6, Homefield, P.O.	44, 160	104, 892.59	105, 322.02	2, 422	131
Willner #253, Rosemae, P.O.	12, 800	49, 618.52	50, 694.58	1, 388	--
Coteau #255, Birsay	27, 520	57, 249.23	57, 272.63	1, 693	16
Monet #257, Elrose	46, 840	104, 877.62	105, 135.47	2, 643	24
Fairview #258 (under construction)	16, 800		34, 404.28		
Newcombe #260, Glidden	52, 800	152, 897.03	158, 035.41	3, 276	23
Mantario #262, Empress, Alta.	24, 960	63, 897.03	67, 323.68	1, 483	--
Wreford #280, Hatfield	13, 440	74, 028.31	77, 518.61	1, 119	--
McCraney #282, Davidson	10, 720	63, 608.76	66, 934.07	1, 562	--
Rudy - Rosedale #284 - 3, Broderick	19, 040	77, 651.42	83, 975.55	1, 947	51
Hillsburgh #289, Brock	13, 600	52, 235.09	52, 235.09	744	--
Eagle Lake #289 - 319, Netherhill	21, 700	50, 610.92	60, 096.92	800	22
Kindersley - Elma #290 - 1, Smiley	21, 400	110, 303.62	110, 303.62	1, 856	43
Usborne #310, Venn	12, 720	36, 570.38	36, 570.38	972	--
Dundum #314, Dundum	44, 960	93, 259.40	110, 144.16	1, 932	--
Montrose #315, Donavon	20, 480	49, 769.60	54, 110.60	1, 196	--
Oakdale #320, Beaufield	20, 800	60, 346.58	60, 346.58	1, 011	32
Antelope Park #322, Hoosier	34, 500	97, 950.60	100, 572.97	2, 267	41
Wolverine #340, Plunkett	16, 480	64, 552.43	64, 552.43	1, 376	--
Mariposa #350, Kerrobert	27, 020	82, 693.92	84, 091.97	2, 042	57
Progress #351, Kerrobert	19, 680	59, 021.39	59, 021.39	1, 390	--
Heart's Hill #352, Compeer, Alta.	15, 160	28, 105.07	28, 105.07	1, 478	1
Park #375, Langham	7, 040	22, 148.62	22, 535.62	396	--
Battle River - Cutknife #438 - 9, Gallivan	30, 720	79, 198.56	80, 098.56	1, 329	44
Royal #465, Marcelin	65, 220	149, 745.77	165, 796.66	1, 075	--
Paynton #470, Paynton	23, 040	70, 337.11	70, 337.11	1, 256	21
Totals for Saskatchewan		3, 881, 857.88	4, 099, 982.98	95, 601	1, 068



Community Pasture and Headquarters	Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1955	Accumulated Cost of Construction March 31, 1956	1955-56	
				Stock Cattle	Pastured Horses
<u>Pasture Operating Units - Manitoba</u>					
Archie Pasture, Welwyn	40,340	83,549.89	88,295.35	1,000	26
Portage Pasture, Poplar Point	14,640	43,026.86	43,385.21	2,284	75
Woodlands Pasture, Poplar Point	20,960	62,732.66	67,942.95	2,000	178
Lakeview Pasture, Langruth	29,280	77,337.63	80,482.71	2,767	11
Westbourne Pasture, Gladstone	11,520	36,566.33	39,156.69	1,380	4
Langford Pasture, Neepawa	19,040	60,099.17	61,676.33	2,080	25
Wallace Pasture, Elkhorn	3,280	(Operated by R. M. Wallace)			
Totals for Manitoba	139,060	392,058.91	409,685.61	11,511	319
GRAND TOTALS	1,712,240	4,273,916.79	4,509,668.59	107,112	1,387

# APPENDIX III

## PRAIRIE FARM REHABILITATION ACT

Showing number of projects and amount of financial assistance paid since the inauguration of program to

March 31, 1956

Province & Classification	DUGOUTS			STOCKWATERING DAMS			IRRIGATION SCHEMES			T O T A L S		
	Projects Paid	Financial Assistance Paid	1,029,928.46	Projects Paid	Financial Assistance Paid	22,677.26	Projects Paid	Financial Assistance Paid	36,263.45	Projects Paid	Financial Assistance Paid	1,088,869.17
MANITOBA	10,431	1,029,928.46		307	22,677.26		119	36,263.45		10,857	1,088,869.17	
Individual	47	9,282.04		26	20,449.43		5	1,373.80		78	31,105.27	
Neighbor & Community												
Total	10,478	1,039,210.50		333	43,126.69		124	37,637.25		10,935	1,119,974.44	
SASKATCHEWAN	28,026	3,113,831.06		4,015	343,237.17		1,988	455,996.31		34,029	3,913,064.54	
Individual	426	178,699.98		142	99,113.19		74	31,050.01		642	308,863.18	
Neighbor & Community												
Total	28,452	3,292,531.04		4,157	442,350.36		2,062	487,046.32		34,671	4,221,927.72	
ALBERTA	3,802	399,178.09		2,042	191,606.88		918	216,897.37		6,762	807,682.34	
Individual	33	10,522.64		43	27,337.61		17	12,402.30		93	50,262.55	
Neighbor & Community												
Total	3,835	409,700.73		2,085	218,944.49		935	229,299.67		6,855	857,944.89	
GRAND TOTAL	42,765	4,741,442.27		6,575	704,421.54		3,121	753,983.24		52,461	6,199,847.05	

APPENDIX IV  
Progress by Years in the Construction of Small Projects P. F. R. A. Water Development Program  
1935 to March 31, 1956

Fiscal Year	Number of Projects Constructed				Financial Assistance Paid on Projects			
	(1) DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	473	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08
1952-53	861	119	288	1,268	100,219.54	13,382.92	92,397.46	205,999.92
1953-54	1,774	178	181	2,133	204,148.93	18,373.83	46,550.99	269,073.75
1954-55	1,300	234	180	1,714	149,184.48	24,751.11	44,473.20	218,408.79
1955-56	493	145	104	742	56,733.44	15,028.46	23,236.94	94,998.84
TOTAL	42,765	6,575	3,121	52,461	4,741,442.27	704,421.54	753,983.24	6,199,847.05

(1) DO - Dugout      SWD - Stock Watering Dam      IRR - Individual Irrigation Project

APPENDIX V  
WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS  
To March 31, 1956

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation McAuley Community Project	Alexander McAuley	Soil Conservation Stockwatering	1944 1955	- -	- 20	\$ 5,250.00 1,595.00
Birtle Dam	Birtle	Stockwatering	1947	-	-	11,490.00
Boissevain	Boissevain	Storage	1954	-	580	29,992.00
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	-	27,107.00
Brandon Water Supply	Brandon	Storage	1940	-	500	3,996.00
Clearwater Storage	Clearwater	Stockwatering	1938	-	12	5,949.00
Crystal City Storage	Crystal City	Stockwatering	1935	-	3	3,334.00
Dead Horse Creek Dam	Morden	Irr. & Stockwatering	1941	100	1,200	344,274.00
Dead Lake Community	Gladstone	Irr. & Stockwatering	1950	20	90	1,933.00
Deloraine	Deloraine	Stockwatering	1953	-	1.5	770.00
Edwards, R.M. of	Melita	Stockwatering	1935	-	100	10,214.00
Hogue Dam	Sanford	Stockwatering	1953	-	-	29,183.00
Hampson Dam	Sanford	Storage	1954	-	420	16,899.00
Hartney	Hartney	Irr. & Dam	1941	-	-	10,264.00
LaSalle River Dams	LaSalle	Stockwatering	1941	-	900	22,989.00
Lewko Dam	Sanford	Storage	1954	-	320	20,874.00
Little Souris River Dam	Melita	Stockwatering	1945	-	250	1,380.00
Melita	Melita	Irr. & Dam	1941	3,900	3,200	11,372.00
Minnedosa Dam	Minnedosa	Storage	1950	20	1,500	105,051.00
Morris River - Rock Lake	Carman	Stockwatering	1940	-	10,000	23,401.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Napinka	Napinka	Irr. & Dam	1941	-	-	6,770.00
Oak Lake	Oak Lake	Irrigation	Incomplete	13,000	-	78,229.00
Park Lake	Neepawa	Stockwatering	1953	-	-	21,626.00
Rosebank Dam	Rosebank	Stockwatering	1948	-	32	12,161.00
Shoal Lake Project	Shoal Lake	Stockwatering	1948	-	3,500	8,491.00
Souris, Town of	Souris	Stockwatering	1935	-	150	76,837.00
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	-	5	1,470.00
Waskada	Waskada	Stockwatering	1953	-	1.5	853.00
Wawanesa	Wawanesa	Irr. & Dam	1941	-	-	125,332.00
Westbourne, R.M. of	Gladstone	Stockwatering	1947	-	-	5,993.00
Whitemud River	Woodside	Stockwatering	1949	-	160	6,506.00
Whitemud River Storage	Gladstone	Stockwatering	1943	-	660	11,464.00
<u>SASKATCHEWAN</u>						
Aberdeen, R.M. of	Aberdeen	Dugout	1955	-	1.5	916.00
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Airdale	Senlac	Dugout	1955	-	1.5	859.00
Allan	Allan	Stockwatering	1948	-	300	4,477.00
Alpine	Senlac	Dugout	1954	-	1.5	794.00
Alticane	Richard	Stockwatering	1951	-	2.5	858.00
Arcola	Arcola	Stockwatering	1939	-	(underground)	17,310.00
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000.00
Avon Heights Grazing Co-op	Shaunavon	Stockwatering	1955	-	60	2,428.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Baldon and Tilney	Baldon	Stockwatering	1950	-	4	780.00
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203.00
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294.00
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739.00
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058.00
Beadle	Beadle	Stockwatering	1949	-	2	997.00
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998.00
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746.00
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Big Arm Storage	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Black Hills Grazing Co-op	Piapot	Dugout	1955	-	5	2,520.00
Boharm	Boharm	Stockwatering	1948	-	100	6,250.00
Bracken	Bracken	Stockwatering	1946	-	158	1,001.00
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
Bright Water Creek	Hanley	Irrigation	1950	2,500	3,500	858.00
Brock Community	Brock	Stockwatering	1949	-	2	951.00
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	(#)	-	83,723.00
Cabri	Cabri	Stockwatering	1948	-	340	37,553.00
Cactus Lake	Cactus Lake	Stockwatering	1949	-	2	730.00
Cadillac	Cadillac	Irrigation & Dam	1945	800	1,350	32,887.00
Camberley	Camberley	Irrigation & Dam	1950	-	100	2,106.00
Canora	Canora	Storage	1941	-	300	16,128.00
Carleton, Hamlet of	Carleton	Dugout	1955	-	1.5	998.00
Caron	Caron	Storage	1948	-	100	17,109.00
Caron Community (Dam) Centre	Caron	Stockwatering	1949	-	4	697.00
Caron Water Development	Thunder Creek	Storage & Dam	1944	-	43,500	710,433.00
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999.00
Ceylon Reservoir	Ceylon	Irrigation & Dam	Incomplete	300	250	6,396.00
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208.00
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999.00
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000.00
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Consul - Vidora	Vidora	Irrigation	1950	3,000	-	62,500.00
Crane Valley	Viceroy	Stockwatering	1950	-	2	599.00
Craven Dam	Qu'Appelle Valley	Irrigation	1943	(*)	-	33,675.00
Crooked & Round Lake	Qu'Appelle Valley	Irr. & Water Control	1941	(*)	-	48,650.00
Cut Knife	Cut Knife	Stockwatering	1950	-	5	280.00
Cypress Storage	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000.00
Davidson	Davidson	Irrigation & Dam	1937	100	277	3,114.00
Davin	Kronau	Stockwatering	1947	-	1,080	13,501.00
Dead Lake	Macoun	Irrigation & Dam	1941	Souris River Development		17,528.00
Delisle	Delisle	Stockwatering	1950	-	45	4,899.00
Denzil	Macklin	Stockwatering	1951	-	2	975.00
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,182.00
Dry Lake	Forward	Stockwatering	1949	-	600	9,729.00
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996.00
Dunning	Radville	Irrigation	1951	120	200	3,566.00
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742.00
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432.00
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998.00
East Borden	Borden	Stockwatering	1950	-	60	526.00
East Manitou	Nielburg	Dugout	1953	-	1.5	789.00
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Eastview	Eastview	Stockwatering	1949	-	200	5,970.00
Eatonia	Eatonia	Stockwatering	1949	-	12	1,199.00
Echo Lake	Qu'Appelle Valley	Irrigation	1943	(*)	-	41,753.00
Edenwold	Balgonie	Stockwatering	1949	-	400	15,599.00
Elfros	Elfros	Stockwatering	1949	-	25	7,330.00
Elfros - Foam Lake	Elfros	Irrigation	1955	4,000	-	9,510.00
		Stockwatering	1950	-	5	999.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Fairyhill	Qu'Appelle Valley	Irr. & Water Control	1941	(#)	-	4,302.00
Fielding	Maymont	Stockwatering	1950	-	50	918.00
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596.00
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348.00
Fillmore Reclamation Project	Fillmore	Irrigation	Incomplete	1,600	-	656.00
Fleming	Moosomin	Stockwatering	1950	-	75	3,282.00
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096.00
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177.00
Girvin	Girvin	Stockwatering	1937	-	19	2,180.00
Glasnevin	Glasnevin	Dugout	1953	-	1.5	554.00
Glenside	Glenside	Stockwatering	1948	-	150	3,286.00
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783.00
Gordon Grazing	Chauvin	Dugout	1953	-	1.5	830.00
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186.00
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917.00
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000.00
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748.00
Hanley	Hanley	Stockwatering	1946	-	60	3,797.00
Harris Reservoir	Maple Creek	Irrigation	Incomplete	1,000	5,000	176,405.00
Hugonard Coulee Dam	Lebert	Irr. & Stockwatering	Incomplete	100	400	20,692.00
Jackfish Creek	Meota	Stockwatering	1943	-	90	2,940.00
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092.00
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946.00
Kaposvar Creek	Melville	Stockwatering	1954	-	1,400	102,747.00
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927.00
Kincaid	Kincaid	Stockwatering	1949	-	10	2,539.00
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007.00
Kisbey Flats	Kisby	Irrigation	1939	2,300	5,000	23,211.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Lac Pelletier	Lac Pelletier	Stockwatering	1937	-	3,350	2,139.00
Lacadena	Lacadena	Irrigation	1954	-	-	9,678.00
Laird, R. M. of	Waldheim	Dugout	1953	-	1.5	999.00
Lafleche	Lafleche	Stockwatering	1940	-	38	2,524.00
Lafleche Dam	Lafleche	Irrigation	Incomplete	15,000	30,120	162,332.00
Lajord	Lajord	Flood Control	1936	-	300	13,800.00
Lake of the Rivers	Assiniboia	Stockwatering	1938	-	300	10,805.00
Lancer Water Users	Lancer	Irrigation	1953	1,265	-	35,000.00
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752.00
Langenburg	Langenburg	Irrigation	Incomplete	-	2.5	3,000.00
Last Mountain Lake	Qu'Appelle Valley	Irrigation & Water Control	1941	(*)	-	42,721.00
Lebret	Qu'Appelle Valley	Irrigation & Water Control	1941	(*)	-	16,307.00
Linacre Grazing Co-op	Fox Valley	Dugout	1955	-	1.5	644.00
Lodge Lake	Evesham	Dugout	1955	-	1.5	939.00
Little Manitou	Senlac	Dugout	1953	-	1.5	862.00
Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771.00
Long Creek #1	Estevan	Stockwatering	1938	-	137	8,729.00
Long Creek #2	Estevan	Stockwatering	1938	-	90	8,701.00
Loon Creek	Markinch	Stockwatering	1945	-	700	7,180.00
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596.00
Meadowland	Macklin	Irrigation	1954	500	-	6,370.00
Manitou Cattle Breeders Co-op	Chauvin	Dugout	1955	-	1.5	935.00
Macklin Storage	Macklin	Stockwatering	Incomplete	-	40	967.00
Mankota Dam	Mankota	Stockwatering	1950	-	10	950.00
Masefield Water Users	Masefield	Stockwatering	Incomplete	500	250	809.00
Montague Lake	Assiniboia	Irrigation	Incomplete	235	-	1,000.00
Maple Creek	Maple Creek	Irrigation & Dam	1938	10,000	23,260	356,179.00
March Flood Irrigation	Cedoux	Irrigation	1948	400	-	1,765.00
Matador	Matador	Irrigation & Dam	1946	120	220	5,216.00
Masefield	Masefield	Stockwatering	1938	-	40	3,187.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
McCraney, R. M. of	Kenaston	Stockwatering	1937	-	350	1, 896.00
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4, 992.00
MacIntosh Slough	Golden Prairie	Irrigation	1949	500	1, 500	1, 990.00
Meeting Lake	Redfield	Stockwatering	1949	-	100	2, 683.00
Melaval	Melaval	Stockwatering	1950	-	18	1, 200.00
Mennon	Waldheim	Stockwatering	1949	-	2	976.00
Meota, R. M. of	Meota	Dugout	1953	-	1.5	1, 000.00
Middle Creek	Battle Creek	Irrigation	1937	1, 000	20, 000	18, 663.00
Mine Coulee	Neptune	Stockwatering	1948	-	40	4, 377.00
Moose Jaw Creek	Lang	Irrigation	1938	2, 250	2, 180	7, 618.00
Moose Mountain	Corning	Irrigation	1937	-	8, 000	14, 829.00
Moosomin Dam	Moosomin	Storage	1954	-	9, 000	389, 432.00
Monet	Hughton	Stockwatering	1949	-	10	878.00
Mossbank	Mossbank	Stockwatering	1949	-	2	875.00
Muenster	Muenster	Irrigation	1949	25	11	2, 754.00
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1, 280	6, 477.00
North Battleford, City of	North Battleford	Dugout	1953	-	1.5	970.00
North End Grazing	Macklin	Dugout	1954	-	1.5	728.00
North Herbert Extension	Herbert	Irrigation	Incomplete	-	-	511, 909.00
North Qu'Appelle	Fort Qu'Appelle	Stockwatering	1948	-	100	2, 386.00
Oxbow	Oxbow	Irrigation & Dam	1941	3, 900	3, 200	17, 436.00
Pasqua	Moose Jaw	Stockwatering	1948	-	40	3, 777.00
Pheasant Creek	Lemberg	Storage	1954	-	500	114, 464.00
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2, 500	7, 360.00
Pipestone Lake	Broadview	Stockwatering	1938	-	1, 600	11, 785.00
Plenty, Village of	Plenty	Dugout	1955	-	1.5	893.00
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14, 838.00
Prairiedale	Superb	Stockwatering	1949	-	2	987.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Radville	Radville	Stockwatering	1947	-	32	5,019.00
Readlyn	Readlyn	Stockwatering	1950	-	3	800.00
Reciprocity	Glen Bain	Irrigation & Dam	1949	2,000	1,750	27,410.00
Reford	Wilkie	Stockwatering	1951	-	160	1,814.00
Reward	Reward	Stockwatering	1951	-	-	921.00
Richman Irrigation	Glen Bain	Irrigation	1949	-	1,000	4,607.00
Richardson - McKinnon	Consul	Irrigation	1946	3,000	-	53,913.00
Rock Glen Grazing	Rock Glen	Irrigation & Dam	1955	600	300	13,455.00
Rosedale	Hanley	Irrigation	1948	60	100	1,016.00
Rosemount Co-op	Landis	Dugout	1953	-	1.5	903.00
Round Hill Water Users	North Battleford	Irrigation & Dam	1950	425	50	4,791.00
Rough Bark Creek	Goodwater	Stockwatering	1937	-	1,500	9,314.00
Russell Creek	Pambrum	Irrigation	1951	1,000	2,000	66,493.00
Salvador	Reward	Stockwatering	1951	-	5	1,000.00
Saskatoon	Saskatoon	Storage	1940	-	1,200	290,446.00
Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29,115.00
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962.00
Shaheen	Rush Lake	Storage & Irrigation	1949	-	300	9,028.00
Sherwood	Regina	Dugout	1948	20	3	697.00
Shrimp Lake	Herschel	Stockwatering	1947	-	450	9,367.00
Stioux Reserve	Fort Qu'Appelle	Stockwatering	1949	-	75	8,605.00
Smiley, Village of	Smiley	Dugout	1949	-	1.5	1,000.00
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998.00
Snake Bite	Beechy	Irrigation	1954	665	-	9,999.00
Snipe Lake	Eston	Stockwatering	1949	-	-	3,415.00
Snowdown	Fox Valley	Dugout	1954	-	1.5	898.00
Souris - Estevan	Estevan	Irrigation & Dam	1941	-	-	91,133.00
Souris River	Weyburn	Flood Control	1948	-	-	11,998.00
South Abernethy Project	Abernethy	Irrigation	1955	320	-	12,438.00
Stelcam Community Dam	Stelcam	Stockwatering	Incomplete	-	360	9,302.00
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8,716.00
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837.00
Stewart Valley Dugout	Stewart Valley	Stockwatering	1950	-	3	799.00
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961.00
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227.00
Swan Hill Grazing Co-op	Donavon	Dugout	1955	-	1.5	637.00
Swift Current	Swift Current	Irrigation & Dam	1946	30,000	95,000	816,472.00
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483.00
Tantallon	Tantallon	Stockwatering	1942	-	-	2,790.00
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204.00
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007.00
Tribune Dam	Tribune	Stockwatering	1950	-	300	6,499.00
Tuax	Tuax	Stockwatering	1949	-	250	11,899.00
Turrell, R.M. of	Spring Valley	Stockwatering	1952	-	10	2,491.00
Tyvan	Tyvan	Stockwatering	1947	-	1,000	11,986.00
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West	Val Marie	Irrigation	1940	4,230	2,000	150,639.00
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133.00
Vera Grazing	Vera	Dugout	1953	-	1.5	891.00
Vera Winter Grazing	Vera	Dugout	1954	-	1.5	820.00
Viceroy	Viceroy	Stockwatering	1950	-	3	798.00
West Poplar #1	Kildeer	Irrigation	Incomplete	750	1,000	4,460.00
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905.00
Weyburn	Weyburn	Flood Irrigation	1940	-	4,000	51,311.00
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452.00
Wilson Lake	Lizard Lake	Irrigation	Incomplete	400	-	1,463.00
Wittrock	Frenchville	Irrigation	1947	520	-	3,884.00
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800.00
Wolverine Creek	Humboldt	Stockwatering	1945	-	522	52,600.00
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337.00
Woodrow - Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wood River Development Wynyard	Coderre and Gravelbourg Wynyard	Stockwatering Stockwatering	1942 1947	- -	4,923 35	33,738.00 6,225.00
Yonker Grazing Co-op Young	Chauvin Young	Dugout Stockwatering	1955 1948	- -	1.5 250	807.00 8,892.00
(*) - Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).						
<u>ALBERTA</u>						
Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252.00
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000.00
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004.00
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
Anatole	Hanna	Stockwatering	1953	-	7	2,990.00
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912.00
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300.00
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990.00
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600.00
Bartman Dam	Cessford	Irrigation & Dam	1943	1,000	3,000	49,100.00
Beaver Creek Stock Ass'n.	Fort Macleod	Dugout	1955	-	-	981.00
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996.00
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	31,453.00
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884.00
Bluefield Grazing Ass'n.	Thelma	Stockwatering	1955	-	30	1,981.00
Bowell	Bowell	Dugout	1954	-	1.5	1,000.00
Bowell West Grazing Ass'n.	Bowell	Dugout	1955	-	1.5	744.00
Bow Island 40 Mile Grazing	Bow Island	Dugout	1954	-	1.5	782.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14, 860. 00
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4, 631. 00
Bull Pound Creek	Hanna	Stockwatering	1939	-	2, 000	-
Bullshead Creek	Medicine Hat	Irrigation & Dam	1940	800	1, 130	8, 170. 00
C. Y. Water Users	Taber	Stockwatering	1949	-	310	16, 477. 00
Canada Land & Irriga. Project	Medicine Hat	Irrigation	1936	45, 000	-	80, 000. 00
Champion	Champion	Irrigation	1954	2, 500	-	4, 984. 00
Clear Lake	High River	Stockwatering	1948	-	10, 000	35, 000. 00
Commodore	Vulcan	Irrigation	1954	400	-	3, 990. 00
Comrey Grazing	Comrey	Dugout	1953	-	1. 5	1, 000. 00
Comrey #2	Comrey	Dugout	1954	-	1. 5	980. 00
Conrich	West Calgary	Irrigation	1954	1, 600	-	6, 240. 00
Consort	Hanna	Stockwatering	1955	-	20	9, 651. 00
Cowley Community	Cowley	Irrigation	1952	750	-	4, 666. 00
Cressday	Medicine Hat	Stockwatering	1954	-	-	13, 541. 00
Dead Fish Creek	Cessford	Irrigation	1949	4, 000	5, 000	47, 832. 00
Del Bonita	Twin River	Stockwatering	1955	-	250	9, 196. 00
Delia	Morrin	Stockwatering	Incomplete	-	165	3, 914. 00
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4, 368. 00
East Berry Creek	Roselynn	Irrigation	1949	1, 500	750	9, 677. 00
Eastern Irrigation District	Brooks	Irrigation	1937	2, 280	22, 000	22, 490. 00
Esler	Hanna	Stockwatering	1954	-	17	2, 808. 00
Esther Flood Irrigation	Macklin	Irrigation	1952	4, 000	5, 000	4, 592. 00
Eureka Irrigation Project	Grassy Lake	Irrigation	1949	12, 000	1, 000	38, 568. 00
Fish Lake	Pincher Creek	Irrigation & Dam	1954	1, 000	-	6, 895. 00
Franklin Coulee	Retlaw	Stockwatering	1948	-	1, 500	20, 125. 00
Graham Creek	Calgary	Stockwatering	1943	-	230	8, 529. 00
Greasewood Coulee	Manyberries	Irrigation & Dam	1954	500	650	9, 798. 00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Hanna	Hanna	Stockwatering	1948	-	500	29,498.00
Hilda Community Project	Hilda	Stockwatering	Incomplete	-	10	4,167.00
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000.00
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795.00
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843.00
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799.00
Kathryn	Calgary	Irrigation & Dam	1954	300	-	9,184.00
Lake Beauvais	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578.00
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345.00
Loveland	Hanna	Irrigation	1954	3,000	-	17,655.00
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993.00
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689.00
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917.00
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473.00
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600.00
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644.00
Mountain View	Mountain View	Storage	1936	-	4,200	3,000.00
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	-	5,630.00
Magrath	Magrath	Irrigation	1939	4,000	-	2,756.00
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000.00
Nobleford Water Users	Nobleford	2 Dugouts	1953	-	3	11,173.00
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943.00
Pancost - Olson Water Users	Bowell	Dugout	1955	-	1.5	999.00
Parfles	Chancellor	Irrigation	1954	250	-	4,730.00
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782.00
	Panora Butte	Stockwatering	1955	450	550	8,993.00

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Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project		
Priddis	High River	Stockwatering	1955	-	312	8,802.00
Provost, Village of	Provost	Stockwatering	Incomplete	-	3	779.00
Ranchville Community Resrvr.	Ranchville	Irrigation	Incomplete	300	-	3,137.00
* Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
Rock Lake Project	Brooks	Storage	Incomplete	11,000	-	882.00
* Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839.00
Roseglen Water Users	Schuler	Irrigation	Incomplete	200	150	779.00
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00
Ross Lake Community	Raymond	Stockwatering	1950	-	300	7,987.00
Rough Meadow Reservoir	Coronation	Irrigation	Incomplete	200	-	2,471.00
Ruks	Pincher Creek	Irrigation & Dam	1954	900	250	6,484.00
Schuler Water Users	Schuler	Stockwatering & Dam	Incomplete	-	5	3,622.00
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518.00
Seven Persons	Seven Persons	Stockwatering	1943	-	800	12,103.00
Seven Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990.00
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797.00
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190.00
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976.00
Spondin	Hanna	Dugout	1955	-	1.5	1,000.00
Starland, M. D. of	Morrin	Stockwatering	Incomplete	-	45	3,196.00
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988.00
South Macleod	Macleod	Irrigation	1948	6,000	-	82,614.00
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999.00
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652.00
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498.00
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486.00
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997.00
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Walsh Flats	Walsh	Irrigation	1953	2, 100	25, 000	4, 700.00
Wheatacre Dam	Rockyford	Irrigation	1950	1, 600	1, 500	12, 976.00
Wild Horse Storage	Cressday	Irrigation	1936	3, 600	4, 500	24, 370.00
Wheatacre #2	Rockyford	Irrigation	1952	-	-	4, 744.00
Wintering Hills	Hussar	Irrigation	1950	1, 000	500	9, 993.00
Woolford Community Project	Cardston	Irrigation	1955	400	-	3, 593.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6, 592.00

\*\* - P. F. R. A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

APPENDIX VI  
MAJOR PROJECTS - IRRIGATION RECLAMATION  
(Projects by Special Votes of Parliament, Administered by P. F. R. A.)  
to March 31, 1956

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
<u>MANITOBA</u>						
Assiniboine River Diking & Cut off	Brandon	River Control	Incomplete	-	-	417,844.00
Riding Mountain	Dauphin	Watershed Control	Incomplete	-	-	695,622.00
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	1,428,606.00
<u>ALBERTA</u>						
Bow River (a) Purchase of Canada Land & Irrigation Company	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(b) Development & Construction						
St. Mary	Lethbridge	Irrigation	Incomplete	519,000	320,000	2,353,182.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	17,451,492.00
						9,308,457.00
						53,901.00
<u>BRITISH COLUMBIA</u>						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00

(Above includes ONLY Construction Costs)

APPENDIX VII  
PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES  
April 1, 1935 - March 31, 1956

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	1935 - 1955	1955 - 1956	Total
<b>ADMINISTRATION</b>			
Ottawa Administration	246, 140	28, 313	274, 453
Regina Administration	1, 078, 253	116, 979	1, 195, 232
Total	1, 324, 393	145, 292	1, 469, 685
<b>EQUIPMENT</b>			
Purchase of Equipment	898, 975	222, 823	1, 121, 798
Upkeep of Equipment	615, 331	131, 909	747, 240
Equipment Depot	1, 343, 313	261, 630	1, 604, 943
Total	2, 857, 619	616, 362	3, 473, 981
<b>LAND UTILIZATION</b>			
Supervision	550, 941	41, 771	592, 712
Construction of Community Pastures	5, 686, 962	453, 101	6, 140, 063
Pasture Improvements	92, 733	83, 148	175, 881
Operation of Community Pastures	3, 313, 933	507, 324	3, 821, 257
Purchase of Bulls	468, 172	76, 293	544, 465
Re-establishment of Farmers	---	---	---
Grass Seeding & Experimental Regrassing	625, 628	20, 237	645, 865
Total	10, 738, 369	1, 181, 874	11, 920, 243
<b>WATER DEVELOPMENT</b>			
Supervision	736, 935	26, 995	763, 930
Small Projects including Engineering	13, 961, 942	809, 867	14, 771, 809
Large Irrigation and Storage Projects			
Supervision	1, 667, 507	53, 760	1, 721, 267
Construction and Improvements	6, 871, 565	556, 484	7, 428, 049
Maintenance and Operation	5, 069, 834	430, 055	5, 499, 889
Re-establishment of Farmers	196, 020	3, 063	199, 083
Surveys and Explorations	1, 660, 484	---	1, 660, 484
Purchase of Land	709, 066	17, 937	727, 003
Total	30, 873, 353	1, 898, 161	32, 771, 514
<b>Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).</b>			
	4, 966, 394	---	4, 966, 394

SPECIAL VOTES UNDER P. F. R. A. ADMINISTRATION

	<u>1935 - 1955</u>	<u>1955 - 1956</u>	<u>Total</u>
Assiniboine River, Surveys and Construction	287,544	196,905	484,449
Lillooet Project B.C. Construction & Exploration	1,170,133	---	1,170,133
Land Reclamation & Development in B. C.	1,812,123	77,466	1,889,589
St. Mary's Irrigation Project - Alberta	14,190,157	672,054	14,862,211
Bow River Project - Alberta	20,511,275	1,966,354	22,477,629
Red Deer River Project - Alberta	785,280	60,004	845,284
Other Miscellaneous Projects - Construction	210,392	---	210,392
Land Protection & Reclamation - Manitoba	1,539,858	584,878	2,124,736
South Saskatchewan River Project - Saskatchewan	3,523,032	355,444	3,878,476
Buffalo Pound Project - Saskatchewan	232,043	382,958	615,001
Surveys and Engineering Costs	<u>5,588,341</u>	<u>1,480,241</u>	<u>7,068,582</u>
 GRAND TOTAL	 <u>49,850,178</u>	 <u>5,776,304</u>	 <u>55,626,482</u>

- (a) Included in Cultural Administration to March 31, 1938.  
 (b) Included in Water Development Administration to March 31, 1938.  
 (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.  
 (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.  
 (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.  
 (f) Includes \$147,530.22 expended on St. Mary Project (administration) in 1947-48.  
 (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P. F. R. A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.  
 (h) General Survey charges now being paid from other P. F. R. A. Votes.  
 (i) Amounts shown in notes (d), (e) and (f) to be added to this total.  
 (j) Veteran's Land Act expenditure not included.  
 (k) Expenditures until 1949-50 included under Land Utilization and Water Development.  
 (l) Previously under P. F. R. A. Vote (see item (g)).  
 (m) Re-establishment of Farmers now under Water Development.  
 (n) Previously under Land Utilization (see item (m)).



EXPENDITURES BY PROVINCES  
PRAIRIE FARM REHABILITATION ACT and SPECIAL VOTES UNDER ITS ADMINISTRATION  
April 1, 1935 - March 31, 1956

P. F. R. A.	Manitoba	Saskatchewan	Alberta	British Columbia
	<u>4,302,218</u>	<u>39,943,195</u>	<u>6,548,142</u>	
Major Irrigation and Reclamation in the Prairie Provinces	24,951	4,589,179	38,148,247	
Land Reclamation, Construction and Development in B. C.				3,059,266
Land Protection and Reclamation	2,124,736			
Diking and Cut off (Assiniboine, Manitoba)	484,449		2,751,861	130,540
Surveys and Engineering Costs	878,706	3,434,549	1,632,164	131,583
Administration	<u>253,363</u>	<u>1,791,150</u>		
	<u>8,068,423</u>	<u>49,758,073</u>	<u>49,080,414</u>	<u>3,321,389</u>
				<u>110,228,299</u>

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REVENUE  
REVENUE RECEIVED FROM PROJECTS UNDER P. F. R. A. OFFICE  
to March 31, 1956

Pasture Operation and General Revenue	4,085,367
Irrigation Project Operation (Under P. F. R. A. Vote)	489,447
Irrigation & General Revenue (Major Projects Vote)	<u>1,203,713</u>
Total	<u>5,778,527</u>

Project	Year Started	Present	Ultimate Proposals	Major Reservoirs	(Live Storage (Acre Feet))	
					Present	Ultimate
Mountain & Foothill Region						
United Irrigation Dist.	1921	21,000	34,000			
Mountain View Irrigation Dist.	1925	3,600	3,600	Driggs Lake	7,500	7,500
Leavitt-Aetna Irr. Dist.	1943	3,600	11,700	Driggs Lake		
MacLeod Irr. Dist.	1948	2,500	10,000			
Other		12,300	30,700			
Total		43,000	90,000			
Western Prairie Region						
St. Mary-Milk River Project	1901	260,000	510,000	St. Mary Reservoir	270,000	270,000
				Chin	50,000	150,000
				Jensen	14,000	14,000
				Ridge	-	80,000
				Verdigris	-	110,000
				Waterton	-	130,000
Bow River Irr. Project	1918	100,000	240,000	Lake McGregor	75,000	250,000
				Travers	100,000	100,000
				Little Bow	12,000	12,000
Western Irr. District	1908	50,000	50,000	Chestermere	3,000	3,000
Eastern Irr. District	1914	200,000	280,000	Lake Newell	90,000	100,000
				Crawling Valley	-	120,000
Lethbridge Northern Irr. Dist.	1922	75,000	96,000	Keho	40,000	40,000
Berry Creek Project	1938	3,000	8,000	Berry Creek Reservoir	30,000	30,000
Red Deer Irr. Project	-	-	300,000	Ardley Reservoir	-	300,000
				Buffalo Lake	-	300,000
				Craig & Hamilton	-	250,000
Other		52,000	201,000			
Total		740,000	1,685,000			
Central Prairie Region						
French Flats-Valley Park	1949	700	6,000			
South Sask. Irr. Project	-	-	470,000	South Sask. Reservoir	-	3,100,000
Red Deer Extension		-	200,000	Delisle Reservoir	-	25,000
Other		13,300	14,000	Blackstrap Reservoir	-	25,000
Total		14,000	690,000	Loverna Reservoir	-	250,000

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
Cypress Hills Region						
Eastend-Val Marie Irr. Projects	1937	10,000	13,000	Cypress Lake Eastend Val Marie Reservoirs Fifty Mile Reservoir	100,000 2,000 12,000 -	100,000 2,000 12,000 80,000
Consul-Vidora Irr. Projects	1945	7,000	10,000			
Ross Creek Irr.	1949	2,000	3,000	Gros Ventre	4,500	8,000
Maple Creek Irr.	1936	5,000	5,000	Downie Lake Junction Harris	10,000 10,000 Incomplete	10,000 10,000 5,000
Swift Current Irr. Project	1940	12,000	21,000	Dunclairn Highfield	85,000 13,000	85,000 13,000
Pontieux Project	1953	1,000	3,000	Gouverneur	10,000	10,000
C��dillac Project	1953	700	800	Cadillac Admiral	1,500 2,500	1,500 2,500
Lafleche Project	-	-	8,000	Lafleche	Incomplete	30,000
Other	-	67,300	98,000			
Total		105,000	161,800			
Eastern Prairie Region						
Lumsden-Fairy Hill Irr.	1910	3,000	6,000	Buffalo Pound Lake	40,000	120,000
Souris-Estevan-Kisbey Irr. Pro.	1937	5,000	11,000	Dead Lake Moose Mountain	3,000 9,000	50,000 9,000
South Saskatchewan Extension-Qu'Appelle	-	-	24,000			
Other	-	20,000	34,000			
Total		28,000	75,000			
Total Irrigation (Alberta & Saskatchewan)		930,000	2,701,800			







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CANADA-DEPARTMENT OF  
AGRICULTURE--PRAIRIE  
FARM REHABILITATION  
BRANCH--REGINA-SASK.

# Annual Report

PRAIRIE FARM REHABILITATION AND RELATED ACTIVITIES

1956-57



PRAIRIE FARM REHABILITATION

and RELATED ACTIVITIES

1956 - 57





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## INTRODUCTION

During the 1935 session of Parliament the Prairie Farm Rehabilitation Act was passed to provide for the rehabilitation of the drought and soil drifting areas in the Provinces of Manitoba, Saskatchewan and Alberta. The object of this Act was to deal with an immediate problem of prolonged drought which was then having a severe effect on agriculture in Western Canada. In addition to the promotion of new and improved cultural practices, provision was made for development of the surface water resources, for stockwatering and domestic use and also for the production of feed and seed supplies through irrigation. In 1937 the Prairie Farm Rehabilitation Act was amended to include land utilization and land settlement as additional objectives. By further amendment in 1939 this Act was extended to remain in force indefinitely.

The area under the supervision of the P. F. R. A. covers approximately 105 million acres. Within this area lies some 47 million acres of improved farm land which is more than half the total improved acreage in Canada. In point of volume of production, the P. F. R. A. area constitutes the most important single agricultural area in Canada and is one of the major wheat producing regions in the world. The P. F. R. A. program is designed to bring about desirable adjustments in agricultural practices which will assist in establishing a sound and progressive agricultural economy in Western Canada.

The conservation of water both on individual farms and in rural communities and the promotion of better land utilization will help minimize the effect of drought should a period of dry years return to the prairies. This program has already been effective in developing increased stability and security through the diversification of agricultural production.

The administration has also been made responsible for several large irrigation and reclamation projects outside the boundaries of P. F. R. A. These projects too have had a beneficial effect on the national agricultural economy by bringing into production, lands which formerly were of limited agricultural value.

Although this report will deal principally with the work done by P. F. R. A. in 1956, it will also review in a general way, the progress of the various programs and projects promoted by P. F. R. A. since its inception in 1935.



## ORGANIZATION AND ADMINISTRATION

The P.F.R.A. has its headquarters at Regina, Saskatchewan. It is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The organization in Regina consists of the Director's Office, the Community Pasture Branch, the Water Development Branch and the Engineering Services Branch; the branch heads being responsible to the Director.

The Director's Office co-ordinates the activities of the different branches of work with the regional, district and special project offices. It also administers resettlement and rehabilitation activities, the Construction Equipment and Supply Division, the Land Division, the Planning and Information Division and the Administration Division. The Community Pasture Branch is an important part of land utilization. It undertakes construction of new pastures and supervises the operation of the community pasture network throughout Saskatchewan and Manitoba. The Water Development Branch covers the extensive program of small and community water storage projects, and the development of small irrigation projects. The Engineering Services Branch is responsible for Surveys, Soil Mechanics, Drainage, Design, Hydrology, Hydraulic Studies, Air Photo Analysis and Engineering Geology, and Stream Bank Erosion Control. These services are co-ordinated to establish the feasibility of the many types of projects that the staff is required to investigate. The construction of major irrigation and reclamation projects is administered through project headquarters.

In addition to the Head Office in Regina there are Regional Offices in Winnipeg, Man., and Kamloops, B.C., plus eighteen District Offices and nine Project Offices throughout the four Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and complexity of the particular project.

Since P.F.R.A. activities are closely allied to those of certain Provincial Government Departments, every endeavour is made to co-operate with these agencies. Similarly, the Branch maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and Hydrometric Service.

Fundamentally, P.F.R.A. is organized to carry out a program of work aimed at a greater security and stability for prairie agriculture.

## COMMUNITY PASTURE PROGRAM

The amendment in 1937 to the **Prairie Farm Rehabilitation Act** broadened its scope to include land utilization and land settlement. This opened the way for a program which has had a far reaching effect on the type and stability of agricultural production in many areas throughout Western Canada. By agreement with the Provinces of Saskatchewan and Manitoba, lands on which cereal crops could not be produced economically, are transferred to the Federal Government for development by P. F. R. A. into community pastures. The province concerned selects the area to be developed and obtains control of the land. The land is then leased to the Government of Canada which in turn agrees to construct, maintain and improve community pasture facilities in the area selected.

As these submarginal and marginal lands are converted into productive pastures, livestock production on the surrounding farms is being increased, thus making possible a greater diversity of farm income. Families located within the boundaries of proposed pastures, are given assistance in moving to better land in the same, or nearby municipalities where they will be in a position to take advantage of the pasture facilities. Where this has not been possible, farmers have been moved to irrigation projects built by P. F. R. A. for resettlement purposes.

Since the Community Pasture program began in 1937, a total of 1,759,570 acres of land have been developed into 61 separate pastures. Details regarding acreage, construction and operating costs, and numbers of livestock pastured on individual pastures, will be found in Appendices I and II of this report.

### PASTURE OPERATIONS

The grazing season extended from the last week of April to the end of October. Excellent grass growth was reported in all pastures with a good carryover going into the winter. Water supplies were generally good during the grazing season although some dams and dug-outs were low in the late fall.

During the year, community pastures provided grazing for 117,441 head of livestock belonging to 5,874 patrons. The pasture acreage was increased by 30,870 acres. There was also an increase of 8,942 head in the number of livestock pastured.

### Pasture Services

Pasturage is allocated by the Pasture Advisory Committee for

each pasture on the basis of need. The Committee also sets the maximum number of stock per patron. This may vary according to local conditions.

#### Pasture Fees

No changes in grazing and service fees for pasture privileges were made in 1956.

#### Haying

A total of 4,900 tons of hay were cut and stacked in community pastures, by farmers, on a share basis. This hay is made up of crested wheat grass, mixed grasses and wild hay. No grass seed was harvested in any of the community pastures during this period.



Aerial photograph of haying operations in the Dundurn Community Pasture. Ref. #11590

#### Regrassing

Through a program of pasture maintenance, 3,873 acres were regrassed in 18 community pastures during the 1956 season. This was made up of 210 acres of mixed grasses for hay, 1090 acres of crested wheat grass and 2,573 acres of a brome and crested wheat grass mixture.

#### Breeding Service

As a requested service by pasture patrons, P.F.R.A. makes

# COMMUNITY PASTURES

## PRAIRIE FARM REHABILITATION ACT

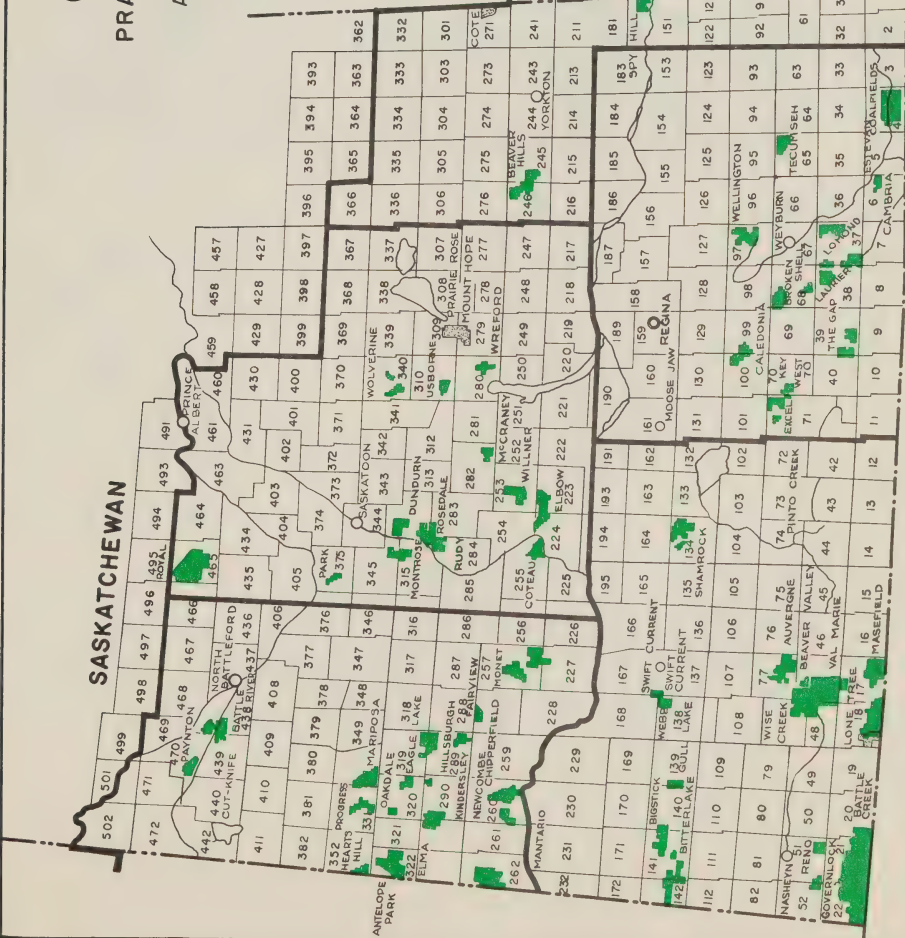
AREA ENCLOSED IN 61 PASTURE UNITS

SASKATCHEWAN — — — 1,600,190  
 MANITOBA — — — 159,380  
 TOTAL — — — 1,759,570

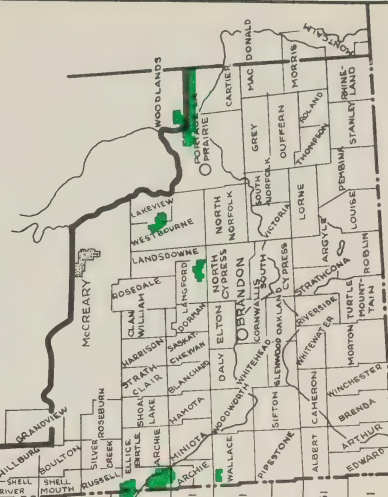
MARCH 31, 1957

- PROPOSED
- COMPLETED
- PASTURE SUPERVISORS' AREA

### SASKATCHEWAN



### MANITOBA







available for use in community pastures, a sufficient number of pure-bred beef bulls to provide adequate breeding services. The breed of bulls used is based on the recommendations made by the respective pasture committees. Since this service began in 1938, 2,229 bulls have been purchased. In 1956 there were 663 bulls owned by P. F. R. A. and 169 bulls rented from pasture patrons, making a total of 832 bulls. Of these, 754 were Herefords, 63 were Shorthorn and 15 were Aberdeen Angus. These bulls serviced 25,974 cows, leaving an estimated 91% calf crop.

During the 1956-57 fiscal year P. F. R. A. purchased 62 pure-bred long yearling bulls and 174 purebred bull calves. These are being developed at the Archie, Outlook and Bitter Lake pastures. One hundred and twenty-five bulls unfit for further breeding service were sold for slaughter during 1956-57. During this period ten died from various causes.

#### Livestock Insurance

To offset losses which are inevitable in livestock operations, livestock insurance is carried by the patrons of 42 community pastures. The total losses from all causes were 634 cattle and 5 horses, which is about one half of one per cent of the stock handled. Of the total losses, 365 cattle and 2 horses were covered by insurance.

	<u>Mutual Ins.</u>	<u>Line Co. Ins.</u>
No. Pastures carrying Insurance	30	12 (4 optional)
Losses	378 cattle -1 horse	136 cattle -2 horses
Eligible for Insurance	296 " -1 "	69 " -1 "
Premium Paid	\$27,117.75	\$7,877.20
Indemnity Paid	\$17,529.29	\$5,393.92
Surplus 1956-1957	\$ 9,588.46	\$2,483.28
Accumulated Surplus	\$37,516.12	
TOTAL surplus (30 pastures)	\$47,104.58	

#### PASTURE CONSTRUCTION

During the 1956-57 construction season, in addition to building minor extensions to existing pastures, the ten P. F. R. A. crews fenced a 7000-acre extension to the Coalfields Pasture, and completed construction of the new 17,000-acre Fairview Pasture. A complete summary of pasture construction operation to March 31, 1957 is presented in the following table:-

Summary of Pasture Construction Activities  
to March 31, 1957

Particulars	Projects Completed in 1956	Repair Work Completed in 1956	TOTAL to March 31 1957
Fencing	130 miles	67 miles	4,530 miles
Corrals	1	8	154
Texas Gates	10	8	223
Buildings:			
Pasture Mgr. Dwellings	3	6	54
Rider's Cabins			26
Barns	3		96
Garages	3		52
Other (Granaries, bullsheds, livestock shelters, etc.)	16	7	247
Water Development:			
Wind Mills	19	6	328
Pumps		10	349
Wells	16	27	315
Springs	12	5	145
Dams	25	14	351
Dugouts	17	7	401

## PASTURE IMPROVEMENT

Land enclosed in community pastures are subject to continuing improvement for pasture purposes. Grass is re-established, convenient watering facilities are provided, and grazing and pasture management policies are adopted, which will assure continuing productivity and maximum utilization of the resources available. Through this program, the carrying capacity of the pastures has been almost trebled.

An advanced program of work involving the application of engineering principles in community pasture improvement has been instituted. This program has now extended to 41 pastures throughout Manitoba and Saskatchewan. In the Parkland areas improvement work is in the form of land clearing and drainage. Large areas being reclaimed by drainage are developed into controlled flood irrigation projects by the installation of control structures. Two thousand acres have been reclaimed in the Beaver Hills Pasture in the last two years.



Pasture Manager's headquarters in Wolverine  
Community Pasture, Sask. Ref. #12840

Land clearing methods vary in accordance with the size and density of the natural tree growth. The following methods are being used:

1. Rotary brushcutters for growth up to 3 1/2" in stem diameter.
2. Winter clearing of heavy growth with bulldozers.
3. Summer clearing of heavy growth with cutters and pilers.
4. Winter clearing of heavy growth with chain and cable.
5. Burning standing growth.
6. Burning knocked down growth.
7. Herbicidal spray by aircraft.

Rotary brushcutters have proved to be the most economical method for clearing brush up to 3 1/2" in diameter. A total of 2400 acres have been cleared by this method at an average cost of \$6.50 per acre.

Winter clearing by bulldozers of heavy growth when the snow is less than 30", is more economical than summer clearing by cutters and pilers. Dozer clearing is limited, however, owing to the fact that cattle cannot graze the area until burning has been completed. This can be accomplished in one or two years as a good growth of natural grass usually develops following the removal of tree shade. Summer



clearing by cutters and pilers has been done for the purpose of fire guarding large areas. This method has also been used where it is warranted by the demand for immediate pasturage.

The cable method of clearing was started in March 1957. By this means the growth was knocked down completely and windrowed in the same operation, allowing the area to be grazed the same year.

This method was found to be economical and highly satisfactory. Owing to the weather conditions, burning of standing growth after fire guarding, has not been significantly successful. Under drier conditions extensive burning might be anticipated.

Herbicidal spraying has been very satisfactory, killing all willow and about 80% of the poplar growth, at an average cost of \$3.00 per acre. All cleared areas must be sprayed to prevent new growth. Grassing of cleared areas has not been extensive because of the resulting heavy growth of natural grasses with the removal of shrub and tree growth. Special equipment is required for seeding grass in these areas.



Aerial spraying in Beaver Hills Community Pasture to prevent re-growth along newly cleared fireguard. Ref. #13773

In the open plains area of Saskatchewan and Manitoba, the pasture improvement program consists of soil and water conservation

practices. Fourteen new dugouts and 21 new dams were constructed in 1956. Repairs were made to 10 existing stockwatering facilities.

Contour furrowing, a practice designed to retain practically all the precipitation which falls on an area, was carried out on a total of 1265 acres in the Val Marie pasture. Water spreading systems covering 80 acres have been constructed at Val Marie and Lone Tree. Water spreading and contour furrowing secure a two-fold purpose. They increase grass production and provide protection for dams and irrigation works by slowing and reducing the run-off in the lower reaches of the drainage area.

Flood irrigation schemes on 1700 acres in three pastures are nearing completion. Topographic surveys have been completed on 5500 acres of range land for the planning of future improvement work. In all, some 12,000 acres have been affected by the improvement program of the last two years.



Dry Lake flood irrigation scheme in Beaver Valley Community Pasture, southwestern Sask.; one of several projects built in recent years under the P. F. R. A. program of pasture improvement. Ref. #12218

## DUNDURN CATTLE MOVEMENT

In July 1956, because the Dundurn Pasture, located 30 miles south of Saskatoon, was requisitioned by the Department of National Defence for military training purposes, it became necessary to move 733 cattle. The original plan was to move these cattle to the Royal pasture about 60 miles west of Prince Albert. As a result of heavy rains in that area, it became necessary to send about half of the cattle to the Wellington pasture some 60 miles southeast of Regina.

Between June 25 and July 11, a fleet of four P. F. R. A. trucks transported 387 cattle to the Royal pasture and 278 cattle to the Wellington pasture. They returned these cattle to the Dundurn pasture at the end of October. Sixty-eight cattle were taken home directly from the Dundurn pasture at the end of June.

The return distance to Royal pasture is 250 miles, while the return distance to the Wellington pasture is 404 miles. It has been estimated that each truck travelled approximately 4500 miles in this cattle movement. No fatalities or injuries were incurred during the transportation of these cattle.

It was not an economical operation but one of necessity. As an emergency measure it did, however, prove the feasibility of such a movement of cattle should conditions arise in the future which would warrant a similar undertaking.

This two-way trucking service was provided at no extra cost to the patrons concerned.

## REHABILITATION AND RESETTLEMENT

Under the terms of the Prairie Farm Rehabilitation Act, provision is made for the rehabilitation and resettlement of farmers from areas of the prairies where drought conditions have rendered farming a hazardous and frequently uneconomic pursuit.

Where it has been possible to achieve satisfactory rehabilitation without the necessity of moving farmers from their present locations, this has been done. In other instances it has been necessary to move settlers to other areas where they can be assured of an adequate living from farming.

In this connection, irrigation has played a major role both in stabilizing production on farms in the drought area, and in providing improved land on which farmers can become permanently rehabilitated

The following is an account of those irrigation projects in Saskatchewan which were built especially for rehabilitation and resettlement purposes, and which the P.F.R.A. on behalf of Canada, is continuing to operate.

### VAL MARIE IRRIGATION PROJECT

Irrigation is carried out on this project by individual farmers in the surrounding district in conjunction with their normal dryland farming operations. The project provides these farmers with a plot of irrigated land on which can be produced an assured winter supply for livestock, and reserves of feed to carry livestock over dry periods. By so doing, the project has allowed farmers in the district to give more emphasis to livestock production, place less reliance on grain farming as the sole source of income, and generally follow a more balanced pattern of land use in their farming operations.

Ninety-four farmers cropped land on the project during 1956, irrigating 5052 acres of land. Forage crops continued to be the main form of production. Yields of forage increased slightly in 1956 over the previous year. This was partly due to an increase in acreages devoted to this crop during 1956, and more favorable weather conditions which permitted farmers to take a second cutting of hay. There has also been a trend to re-vitalize old stands of grass by breaking and re-seeding, which has tended to further increase yields.

Work carried out on the project during 1956 included completing of construction on 4 1/2 miles of main drain under improvement in the south portion of the project and repair and replacement of existing irrigation and drainage structures where this work was indicated. In addition, six single-span pile bridges were constructed over the main canal and laterals in the south section of the project to replace mud sill bridges no longer safe for farm traffic.



East of the town of Val Marie, three hundred feet of main canal bank along the river, which has shown indications of instability, were investigated during the past summer by the Soil Mechanics Division of P. F. R. A. Based on their recommendations, it is planned that the main canal at one point will be partially relocated and lined with compacted clay. At another location the toe of the canal bank next to the river will be protected and stabilized with brush and gravel, and by driving piling at ten-foot centers along the bank next to the stream.

Finally, portions of the greasebrush area in the center block intended for use as irrigated pasture, were seeded for the second year to a grass mixture. Poor surface drainage in this area and the difficulty of establishing stands on heavy gumbo soils, which tend to crust heavily, have been the main problems hindering development of this area.

#### WEST VAL MARIE IRRIGATION PROJECT

The West Val Marie Irrigation Project serves a similar purpose to the Val Marie Irrigation Project. Thirty-five hundred acres in size, the project has helped materially to diversify and stabilize agriculture in the surrounding region by providing assured feed supplies and supplementary pasturage for livestock. A portion of the area, involving approximately 800 acres of land, which can be partially irrigated, is fenced and cross fenced for use by the Val Marie Community Pasture. The remainder is subdivided into fields which are rented out to farmers for hay under lease or hay permit. A further subdivision is made of land fronting on the Frenchman River, as building sites for farmers who wish to move on to the project.

Forty-nine farmers cropped land on the project during 1956, including 18 on Lease Agreements, and 31 on Hay Permits. The total acreage now in forage amounts to 2210 acres in this area. Production of forage on 1803 acres from which hay was cut, amounted to 4186 tons or 2.3 tons per acre. This represents an increase in acreage in forage over 1955, of 408 acres and an average increase in production for the area of approximately 1/2 ton per acre. Some of this increase in production, however, is offset by the fact that farmers in 1955 were unable to take a second cutting of forage due to unfavorable weather conditions and grazed the hay lands instead.

Patronage on the project increased by 9 farmers during 1956. No land has yet been let out on Sale Agreement. However, legal survey parties are continuing their work of establishing irrigation subdivisions on the project in preparation for this eventuality. Twenty or more farmers have already indicated their desire to enter into such an agreement.

Eight of the 15 river subdivisions have now been occupied by full-time resident farmers. One new settler will move onto a lot during 1957. The remaining lots are let out each season on yearly leases and hay permits.

PASTURE LAND

PASTURE LAND

PASTURE LAND

PROPOSED RESERVOIR  
50 MILE LAKE

WEST VAL MARIE  
RESERVOIR and DAM

MAIN CANALS and  
IRRIGATED AREA

VAL MARIE DAM  
and RESERVOIR

MAIN CANALS and  
IRRIGATED AREA

The FRENCHMAN  
RIVER

MAIN CANALS and  
IRRIGATED AREA

# IRRIGATION - GRAZING LAND RELATIONSHIP

VAL MARIE PROJECT  
FRENCHMAN RIVER

CANADA  
Department of Agriculture  
· P.F.R.A. ·

MARCH 31, 1957

IRRIGATED LAND

GRAZING LAND





In the area reserved for use by the Val Marie Community Pasture, one field 450 acres in size, carried 350 head of yearling cattle for three months. Another 350-acre field carried 125 head of cattle for two months. Five hundred head of cattle were permitted to graze the entire Project area during December and January. Most of the 500 cattle grazed in the area during December and January will continue to be fed on the project until spring. Sixty acres of land were reserved by the Community Pasture for the production of hay as winter feed for their breeding bulls. One hundred and twenty tons were harvested from this area during 1956.

Land development and the building of suitable irrigation structures continued to be the main feature of work on the project during 1956. A further 396 acres of land were seeded to forage in the fall of 1956 after all other land preparation and irrigation development work was completed, in readiness for leasing to farmers in 1957. A good catch of grass was obtained on all but 160 acres which may have to be re-seeded in 1957.

A welcome addition to the project in 1956 was a 14 mile telephone line linking both irrigation and pasture headquarters to the town of Val Marie. This line, which was constructed with project labor, was completed early in the spring of 1956. During the short time it has been in operation it has contributed much to the efficient operation of both irrigation and pasture divisions.

#### EASTEND IRRIGATION PROJECT

The Eastend Irrigation Project contains 2750 acres of irrigable land operated by 40 plot holders under the following disposition:

Acreage in forage	-	1840 acres
Acreage in cereal crops	-	510 acres
Acreage not assessed,		
due to seepage	-	240 acres
Rough irrigable land		
used for grazing	-	160 acres

During 1956, 1970 acres of this area were irrigated - 1550 acres with one application of water, and 420 acres with two applications. As in the case of the Val Marie and West Val Marie Irrigation Projects, the main form of production is forage crops. Farmers have recognized, as on the other projects, that hay and livestock must be regarded as synonymous with one another and that together they provide for a more stable and secure agriculture in those regions. The acreage in forage has shown continued increases over the years on this project.





A typical area of irrigated land on the East-end Irrigation Project as seen from the air.

Ref. #11648

Correspondingly, numbers of livestock on farms operated by patrons of the project, have also shown a continuing increase. There are now 800 more acres in forage on the project than there was in 1953. There are also 1400 more head of cattle on farms of project patrons than in 1953. This trend is indicative of a move on the part of farmers to adopt more improved land use practices in their farming operations. Production of forage on the project during 1956 amounted to approximately 1700 tons, sufficient to supplement the winter feed requirements of the 3200 head of cattle, and 2200 head of sheep owned by farmers using the project.

Alkali problems have developed in certain sections of the project due to seepage. Intensive work has been conducted during recent years by the Drainage Division of P. F. R. A. to reclaim these areas and prevent further seepage problems developing.

During the past season, P. F. R. A. purchased additional land on the project for irrigation development. This area, commonly referred to as the Uglum extension, consists of approximately 550 acres of irrigable land on the south side of the river approximately half way down the project to the southeast of the town of Eastend. The land, which will be developed in 1957 is considered to be ideally suited for

irrigation and will be a valuable addition to the project. A further 150 acres of privately owned land exists in this area which can be served by the canal which will supply water to the Uglum extension.

### CONSUL IRRIGATION PROJECT

This project is located in the very heart of the dry area of the prairies. Farmers who settled in this region in the early days found they could not make a living from straight grain farming and eventually had to relinquish their holdings or branch out into livestock production. The region is ideally suited for raising cattle when a reliable source of feed is established. Fodder crops in turn, require irrigation, and this creates a constant demand for irrigated land in the Consul district.



Wilson Weir on Battle Creek - one of several structures on streams rising in the Cypress Hills which have been built by P. F. R. A. to make maximum use of water resources in this region for irrigation and stockwatering purposes.

Ref. #10881

There were 50 plot holders on this Consul Project during 1956, irrigating 2540 acres of land of which approximately 95% was devoted to fodder crops. Two thousand three hundred tons of hay were cut off this area in 1956. In addition, the hay lands were used extensively during the fall of 1956 for grazing.

Four hundred and eighty acres of land on the Richardson-McKinnon section of the Consul Project and at Nashlyn, are under development. Of this amount, some 230 acres will be ready for lease to farmers in 1957. The development of a further 700 acres of land mainly in the Nashlyn district, is also being seriously considered for irrigation development during the next three or four years due to the continuing demand by farmers for more land on the project.

P. F. R. A. crews and equipment were kept busy during the year, cleaning and repairing ditches and canals, controlling weeds and re-grassing old ditch banks, and repairing irrigation structures as part of the normal maintenance work carried out on the project each year. In addition, P. F. R. A. assisted farmers on the project to level 325 acres of land with scraper plane leveller during 1956.

### MAPLE CREEK IRRIGATION PROJECT

This 10,000-acre irrigation project provides assured feed supplies for a livestock population of 10,000 cattle and 2,000 sheep on some 130 farms and ranches in surrounding areas. The fact that Maple Creek is one of the leading shipping points in Saskatchewan for cattle, points to the importance of the irrigation project to that industry as a source of assured feed supply. Over 10,000 tons of feed were produced on the project during 1956.

Much of the work carried out by project forces during 1956 was devoted to project improvement. Farmers were assisted to level their land more efficiently for irrigation, many worn out irrigation structures were repaired or replaced and canals in many areas were cleaned and otherwise repaired.

A major undertaking, the construction of the Harris Dam and appurtenant works, was completed in 1956, which should materially improve the critical water supply situation on Maple Creek Flats. To complete the job in 1956 involved topping the dam with a 7-foot fill, riprapping, and compaction of dirt surrounding the diversion outlet pipe to Maple Creek.

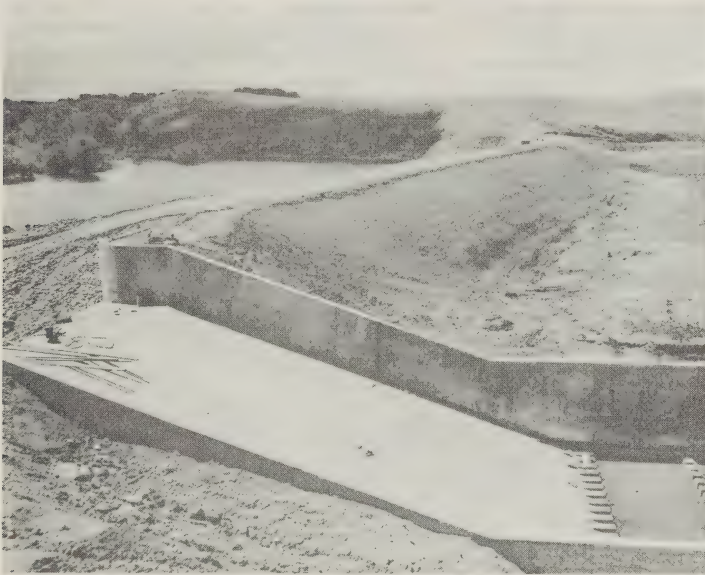
Work was continued during 1956 to reclaim areas on the project, particularly on the Upper and Lower V's, which, due to high water table have become alkaline and unproductive. This included the installation of improved surface drainage facilities and the establishment of deep-well pumping sites in the more seriously effected areas. During the summer season, electric pumps were installed in 4 wells on the Lower 'V' Flats and a fifth well was constructed. In addition to having the effect of lowering the general level of groundwater on the Lower 'V' Flats with the use of these wells, it is expected that the water derived from the wells will be of sufficiently suitable quality to be used again for irrigation.

Land development on the project during 1956 was confined to a 235-acre block of land on the Maple Creek Flats, and 75 acres of



rougher dry land bordering Maple Creek which will be used as irrigated pasturage. Two hundred and fifty acres of land developed and seeded to grass in 1955 were leased out for hay production during 1956.

There is a definite trend on this project among farmers, to enter into more specialized fields of agricultural production. In particular, feed lots for cattle are becoming more common. It has been found that by fattening cattle on the project and selling them in carload lots, it is possible to command higher prices. In addition, several small dairy herds and poultry flocks have become established. A local creamery in town provides a ready market for this form of produce.



Diversion Dam and Spillway on Maple Creek  
with the outlet structure to Harris Reservoir  
in the background. Ref. #10976

#### SWIFT CURRENT IRRIGATION PROJECT

There are approximately 21,000 acres of irrigable land on this project, of which some 12,000 acres have been, or are under-going development at the present time in the irrigation districts of Swift Current, Waldeck, Rush Lake and Herbert. The Swift Current, Waldeck and Herbert irrigation districts use water supplied to them through P. F. R. A. works which they purchase at a nominal charge. Otherwise, being largely privately owned, they operate independently of P. F. R. A. The Rush Lake District on the other hand, consists



mainly of Crown owned land and is being developed by P. F. R. A. in accordance with the Government of Canada's rehabilitation policies.

In the northern section of the Rush Lake District there are 4,700 acres of land divided into 149 forty-acre plots which are let out on yearly lease to farmers, principally for hay production. In addition, smaller building lots adjacent to the village of Rush Lake have been set aside for farmers who wish to settle permanently on the project. Of the 13 farmers now established on these building lots, 7 have gone into dairying and now have well-established dairy herds. For summer grazing these farmers depend upon irrigated pasturage, and for winter feed supplies, forage produced on the project.

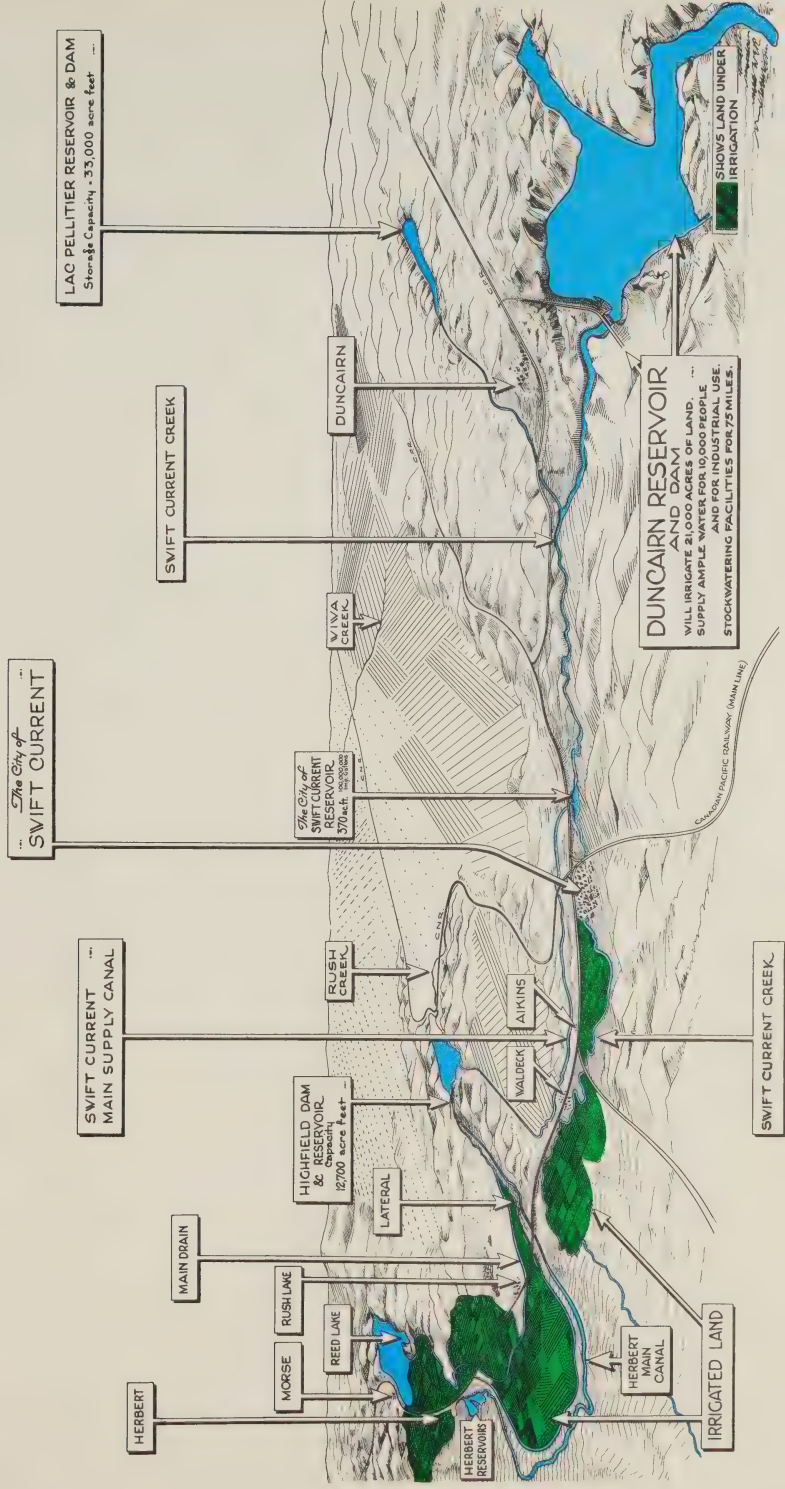
South Rush Lake contains 1,500 acres of land which have not as yet been developed for irrigation but are subject to partial flooding in the spring of the year. This area has been divided into twenty 40-acre plots and leased during the past 5 years to farmers in the district. A program was started in 1956 to seed the area down to permanent forage crops.



Baled hay produced under irrigation on the Rush Lake Flats - Swift Current Irrigation Project.

Ref. #11034

All season project forces and equipment were steadily employed installing and repairing structure, repairing ditch banks, levelling spoilbanks and cleaning supply and drainage ditches, as well as continuing with the program started in 1951 of getting all land on



MARCH 31, 1957



the project, into forage rotation. In regard to this latter work, an additional 775 acres were seeded down to forage during the year, bringing the total of land in forage in the Rush Lake District, to 3540 acres or 75% of the total developed irrigable acreage on the flats.

In a feed-deficient area, forage production on the Swift Current Project has greatly added to the stability of the livestock industry in this region.



## WATER DEVELOPMENT PROGRAM

Conservation of water on farms in rural communities is having an ever increasing effect on the stability of Western Canadian agriculture. Water, as a natural resource, is second only to soil. One of the primary objectives of the Prairie Farm Rehabilitation Act was to introduce a water conservation program which would afford greater economic security to the agricultural population of Western Canada. This program is under the supervision of the Water Development Branch.

Three main phases of water conservation are undertaken by this Branch of P. F. R. A.

### INDIVIDUAL AND NEIGHBOUR PROJECTS

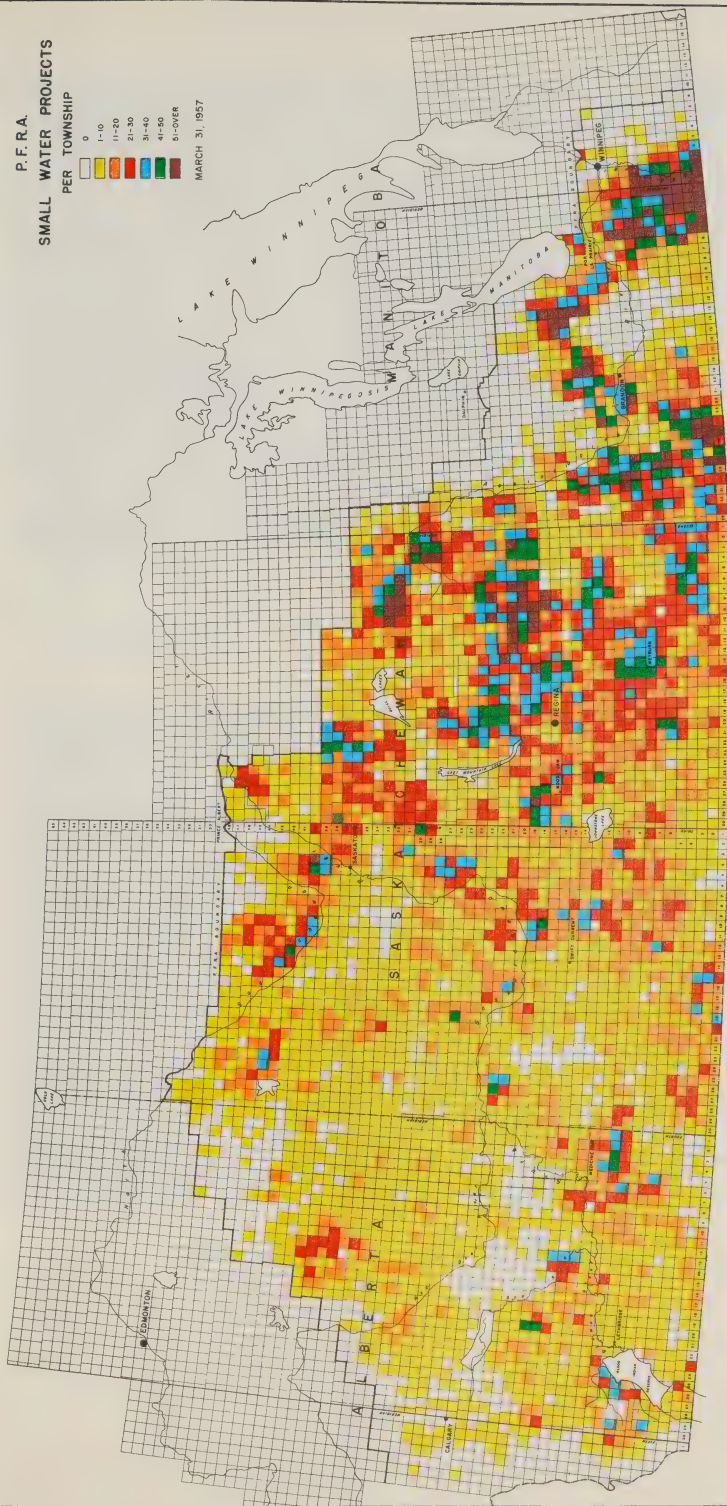


A well-protected, conveniently located farm dug-out typical of many constructed with P. F. R. A. assistance, supplying water for domestic use as well as irrigation of the farm garden.

Ref. #1264

These projects, which usually do not cost in excess of \$1000.00, are designed to conserve run-off water for domestic use, stockwatering and irrigation purposes, in properly located dugouts, dams or dikes on farm watersheds. Financial assistance is provided in an amount relative to the size and purpose of the project. In addition, all engineering services are provided by P. F. R. A. free of charge. The responsibility for construction, however, remains with the individual or neighbouring farmers who make application for the project.

P. F. R. A.  
 SMALL WATER PROJECTS  
 PER TOWNSHIP  
 0  
 1-10  
 11-20  
 21-30  
 31-40  
 41-50  
 51-OVER  
 MARCH 31, 1957







A neighbor stockwatering dam in southwestern  
Saskatchewan. Ref. #5952



A small community dam at Truax, Saskatchewan.  
Ref. #11771



During 1956, financial assistance was paid on 868 dugouts, 143 stockwatering dams and 107 small irrigation projects. The assistance averaged \$107.50 on dugouts, \$104.60 on stockwatering dams and \$225.70 on irrigation projects as compared with the long-time average of \$107.52, \$88.00 and \$234.00 respectively. These payments represent about one-third of the total outlay for construction of individual and neighbor projects. Rates of assistance have remained unchanged during the past year.

## SMALL COMMUNITY PROJECTS

Agricultural groups wishing to utilize the water of the more well defined watersheds on a community basis may apply to P. F. R. A. for assistance, the extent of the assistance granted is determined on the basis of individual merit. These projects usually do not exceed \$15,000 in cost.

Construction was started on 34 new small community projects during 1956 in addition to the continuation of construction on 16 small community projects only partially completed the previous year. Of the 30 reported completed by the fiscal year end, 13 were stockwatering dams and dugouts, 14 were multiple-purpose reservoirs and 3 were flood irrigation projects.

## LARGE COMMUNITY PROJECTS

When a project costs in excess of \$15,000 yet is too small to be considered in the category of a major irrigation or reclamation development, P. F. R. A. usually agrees to undertake the construction of the capital works, provided the province or community concerned will undertake the development and maintenance of the project after it has been completed. Actual construction of these projects is by competitive bid under the supervision of the engineering division of P. F. R. A. Projects of this kind usually provide one or more of the following services - stockwatering, water storage, flood control, irrigation and reclamation. Those serving several purposes are termed multiple-purpose projects; others are designated according to their principal function.

Ten large community projects previously investigated by the field force of P. F. R. A. were advanced to the construction stage. Following is an outline of each of these projects, indicating the location, use and type of development, and purpose.

### Adair Creek Dam

This combination stockwatering and water storage dam, constructed on the Adair Creek about three miles south of the town of Wolseley, has a storage capacity of 350 acre feet. Besides maintaining and controlling the flow of water in Adair Creek, thereby affecting 120

# COMMUNITY WATER DEVELOPMENT PROJECTS

COMPLETED IN 1956

## MANITOBA

<u>Name of Project</u>	<u>Location</u>	<u>Type of Project</u>
1. Killarney	Killarney	Multi-purpose Reservoir
2. Oak Lake	Oak Lake	Irrigation
3. Turtle Mountain Res.	Boissevain	Multi-purpose Reservoir

## SASKATCHEWAN

4. Adair Creek	Wolseley	Multi-purpose Dam
5. Alpine	Senlac	Dugout
6. Avonhurst	Qu' Appelle	Stockwatering
7. Boharm Community Dugout	Boharm	Multi-purpose Reservoir
8. Bright Water Creek	Hanley	Irrigation
9. Harris Reservoir	Maple Creek	Irrigation
10. Hugonard Coulee Dam	Lebret	Multi-purpose Reservoir
11. Jubilee	Indian Head	Multi-purpose Reservoir
12. Kincaid	Kincaid	Stockwatering
13. Koch-Froh	Qu' Appelle	Multi-purpose Reservoir
14. Leroy, R. M. of	Leroy	Stockwatering
15. Prospect Grazing Co-op.	Linacre	Stockwatering
16. Southey, Village of	Southey	Multi-purpose Reservoir
17. Sunny South	Indian Head	Multi-purpose Reservoir
18. Swanson Co-op. Pasture	Donavon	Stockwatering
19. Twelve Mile Lake	Maxstone	Flood Irrigation

## ALBERTA

20. Balzac	Balzac	Irrigation
21. Bare Creek #2	Comrey	Multi-purpose Dam
22. Bluefield Grazing Assoc.	Thelma	Stockwatering
23. B. T. Grazing Co-op.	Hilda	Stockwatering
24. Collins	Sheerness	Stockwatering Reservoir
25. Fertility Grazing Assoc.	Hanna	Stockwatering Reservoir
26. Garden Plains	Hanna	Stockwatering
27. Grainger	Three Hills	Multi-purpose Reservoir
28. Jaydot	Elkwater	Multi-purpose Reservoir
29. Morley	Morley	Stockwatering
30. Naismith	Youngstown	Multi-purpose Reservoir
31. Provost, Village of	Provost	Multi-purpose Dam
32. Stehr Coulee	Walsh	Multi-purpose Reservoir









farmers, this dam will also maintain the supply of water in the local reservoir which now serves a community of about 1000 people. In addition, this dam will give some measure of flood control in the Qu' Appelle Valley.

#### Harris Dam and Reservoir

In order to supplement existing water storage facilities on the Maple Creek Irrigation Project, an irrigation reservoir was constructed between the West Branch of Maple Creek and Gap Creek about six miles south of the town of Maple Creek. Construction on this project began in 1955 and was completed sufficiently early in 1956 to allow water stored during the spring run-off, to be used for irrigation during July.

The Harris Reservoir has a storage capacity of 5000 acre feet of water. This water, diverted from the West Branch of Maple Creek, through a canal system, may be released either down Gap Creek or returned to Maple Creek as it is required.

#### Hugonard Dam

The construction of this multiple-purpose dam about 1 mile north of Lebret has created storage for about 400 acre feet of water, which is to be used for stockwatering, irrigation and a water supply for the village of Lebret. It is estimated that it will be possible to irrigate up to 100 acres from the reservoir, including the gardens of the Lebret Indian Farm School. In addition, this project will aid in flood control in the Qu' Appelle Valley and in the Lebret area in particular.



Hugonard Reservoir showing drop spillway inlet  
with guard fence. Ref. #13433

### Killarney Dam

The area around Killarney depends upon Killarney Lake for its water supply. A dam built on White Mud Creek was circumvented by channel erosion. To restore and maintain the level of Killarney Lake, a dam was constructed across the White Mud Creek Ravine, 1 1/2 miles south of Killarney. Besides stockwatering, the water stored in Killarney Lake may, by pumping, be used for irrigation of specialized crops. The maintenance of the level of this lake also assures the town of an adequate domestic water supply.



An aerial view of the Killarney Project in south-central Manitoba, south of the town of Killarney  
Ref. #12736

### Oak Lake Project

To control the flooding of the Pipestone Creek in the Oak Lake area of Manitoba, a flood control program consisting of channel improvement, diking, and diversion and drainage canals was undertaken in 1955 and completed in 1956. By assisting in controlling the flow of water in the Pipestone Creek, this project will benefit the area in several ways. Flood protection and drainage will facilitate land reclamation. Controlled flood irrigation of hay meadows makes possible, better utilization of the water in the Pipestone Creek.

### Bedford Slough

This multiple-purpose reservoir located 30 miles east of Manyberries, Alta., is being constructed to increase the water storage capacity in the Lodge Creek drainage basin. Bedford Slough has

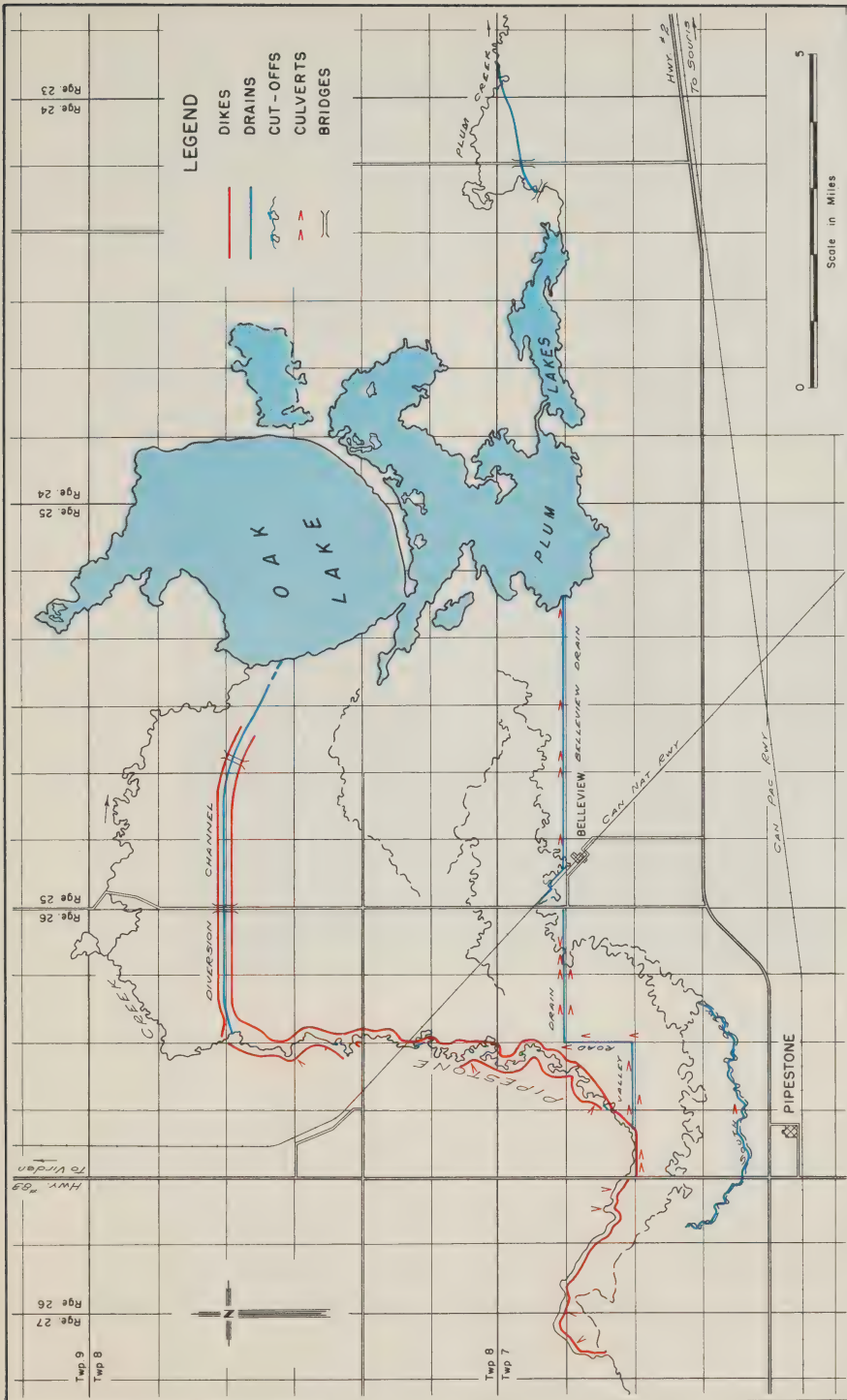


PLATE VI

DEPARTMENT OF AGRICULTURE - CANADA  
P.F.R.A.

OAK LAKE PROJECT

# PROJECT AS CONSTRUCTED

MARCH 31, 1957





a potential storage capacity of 20,000 acre feet of water. Present construction permits 5000 acre feet of water to be stored. This reservoir will serve the Provincial Spangler project, the P.F.R.A. Govenlock Community Pasture and the farmers and ranchers of the surrounding area. This project also makes possible the utilization of Canada's share of the waters of this international watershed.

#### Lafleche Dam

As part of the development of the Wood Mountain watershed, a dam is being built on the Wood River between Lafleche and Gravelbourg, to provide water for irrigation and stockwatering. When completed, this dam will store 30,000 acre feet of water and will provide for irrigation of some 15,000 acres of land between Lafleche and Johnston Lake. In addition, this reservoir will provide an available water supply for the residents of the towns of Lafleche and Gravelbourg.



Spillway for Lafleche Project showing stilling basin, pressure relief openings and radial gates  
Ref. #12358

#### Little Manitou Lake - Diversion Canal

An open canal 7 miles in length is being constructed to divert the flood waters from Lanigan Creek into Manitou Lake instead of Last Mountain Lake. This will provide some measure of flood control in the Last Mountain Lake area and will also help maintain the level of Manitou Lake and Fresh Water Lake; the latter being the source of domestic water supply for the town of Watrous.

### Rock Lake Dam

To provide increased water storage in the Eastern Irrigation District, a dam is being constructed in Rock Lake Coulee converting this drainage basin into a water storage reservoir. The entire capacity of 11,000 acre feet of water will be usable as there is no dead storage. This will be used to alleviate the water supply problem during the peak of the irrigation season.

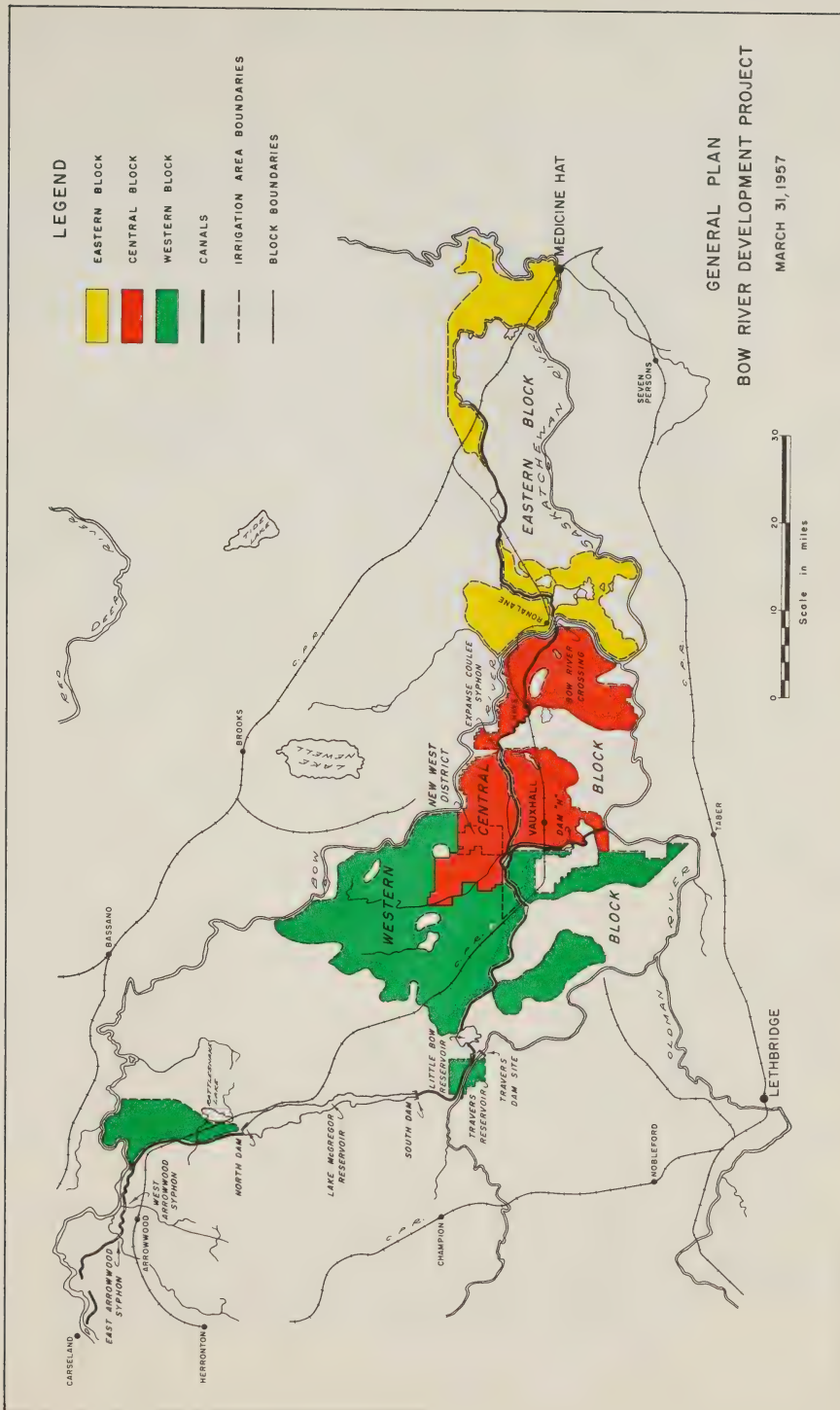
### Dominion City Dam

A dam is being constructed at Dominion City which will regulate the flow of the Roseau River. The water storage created by this dam will be used for stockwatering and domestic water supply in the village of Dominion City. In an area where there is no other satisfactory water supply, it is estimated that 105 people will benefit directly and 700 indirectly by this project.

### TECHNICAL ASSISTANCE

In addition to financial assistance referred to in the previous sections, the following free field services were provided by the Water Development Branch in 1956:-

	<u>Agricultural Services</u>	<u>Engineering Services</u>
<u>Dugouts</u>		
Preliminary calls	888	
Final Inspections	967	
Miscellaneous Inspections	633	
<u>Stockwatering Dams</u>		
Preliminary calls	300	-
Final Inspections	51	164
Miscellaneous Inspections	190	703
Surveys Completed	-	264
Plans prepared	-	230
<u>Small Irrigation Projects</u>		
Preliminary calls	385	-
Final Inspections	50	84
Miscellaneous Inspections	381	867
Surveys completed	-	214
Plans prepared	-	167
<u>Community Projects</u>		
Preliminary calls	114	-
Final Inspections	22	73
Miscellaneous Inspections	577	267
Surveys completed	-	75
Plans prepared	-	71
Sub Totals	4,558	3,179
TOTAL		<u>7,737</u>







## MAJOR IRRIGATION AND RECLAMATION PROJECTS

The development of large irrigation and reclamation works in Western Canada which, either because of their size or location, have not been included under the regular P. F. R. A. appropriation, have in recent years been under the supervision of the Prairie Farm Rehabilitation Administration. These projects are undertaken by agreement between the Federal Government and the Provincial Government concerned, on a cost sharing basis. Special vote of Parliament is required for the authorization of these major projects.

### Bow River Irrigation Project

The first phase of the work on the Bow River Project, which included the renovation and enlarging of the original facilities, is now nearing completion. The two remaining major jobs to be done are the installation of a new diversion structure on the Bow River at Carseland to replace the older portion of the weir built by the Canada Land and Irrigation Company in 1912, and the improvements required on the south dam of Lake McGregor which will increase the capacity of the lake from about 160,000 acre feet to 300,000 acre feet. This in turn will require the raising of Lomond Crossing.

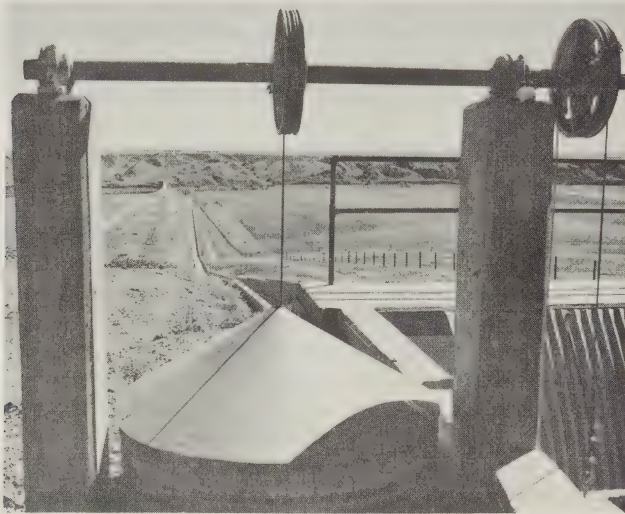
The development of land and irrigation distribution facilities on the project is also well advanced. The main work still to be completed is in the West Block where approximately 80,000 acres of land are currently being developed by the Province of Alberta. P. F. R. A. engineering assistance is being given in the planning, investigation and design of irrigation structures for this project, as well as the preparation of specifications for construction and drawing up of construction material lists in a form which can be used for actual ordering.

### Construction and Renovation

The principal work in 1956 was the completion of construction on the Ronalane Wasteway and a continuation of construction work on the irrigation distribution and drainage system. A total of 259 new and renewal structures were built and 34 structures were repaired. This included the construction of one Main Canal concrete check structure and a turnout for Lateral 'C'. Fifty-six Texas gates were placed along the Main Canal between Little Bow Reservoir and Expanse Coulee and 70 culverts were installed in the drainage ditches.

A program of ditch bank levelling was initiated, and a start was made to level and strengthen all ditch banks in the project. Completed banks were seeded to grass. This will stabilize the ditch banks and facilitate weed control in future years as mowers and weed sprayers will be able to operate on these new banks in a normal way. A total of about 54 miles of ditch banks were levelled in 1956.

Drainage work was confined mainly to open drains. Closed drain construction was slowed down until studies could be made of the effectiveness of those installed in previous years. Two closed drains under construction in 1955 were completed in 1956. These were located on the Windmill Flats at Hays and on S. 21-13-16/4 in the Vauxhall area. A total of 5,211 lineal feet of tile was installed.



Ronalane Wasteway used to pass surplus water from the main canal back into the Bow River.

Ref. #13797

On open drain construction, the main work was the deepening of Drain No. 8 between Grantham Lakes and Drain No. 1. This drain was deepened an average of 8 feet for 2 1/2 miles. A number of smaller drains totalling 73,900 feet were constructed during the year. Twenty-two miles of drain were satisfactorily cleaned by use of a chamshell bucket.

#### Operation and Maintenance

Weather conditions for both construction and crop production were good during 1956. Rainfall was higher than average and crops grown on dry land yielded well. Early spring rainfall was below normal and early season irrigation was heavy. A total flow of 53,512 acre feet of water was used during the season. This was used on 394 farm units in the Vauxhall area and 173 units in the Hays area; 33 of the latter being irrigated for the first time.

The spring run-off into Travers Reservoir was low in 1956 being 26,530 acre feet. A total of 104,237 acre feet were diverted

# BOW RIVER PROJECT

RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1957

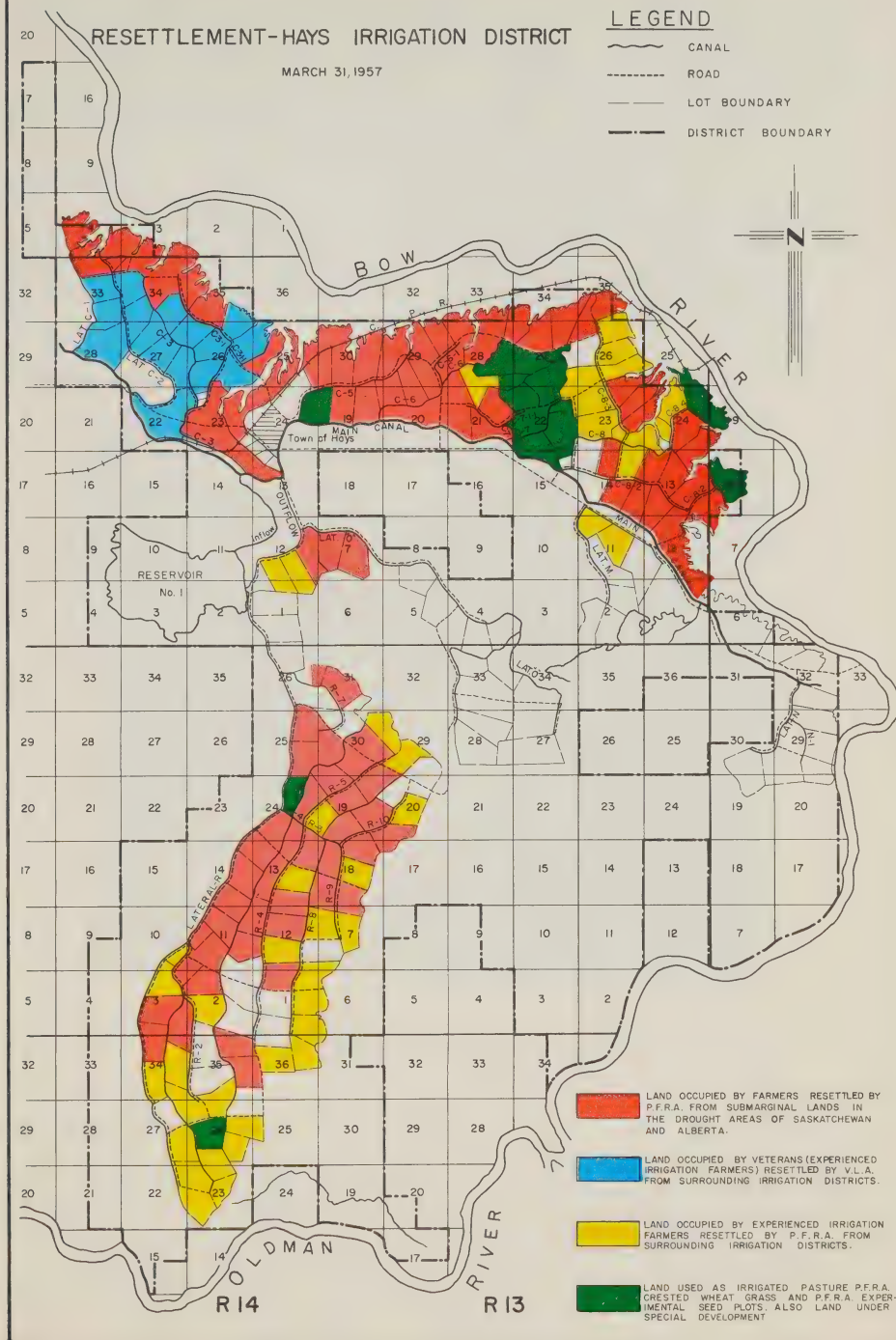
## LEGEND

- CANAL
- - - ROAD
- - - LOT BOUNDARY
- DISTRICT BOUNDARY

T 14

T 13

T 12







from Lake McGregor to Travers Reservoir. The inflow to Lake McGregor from Carseland was 54,300 acre feet, leaving Lake McGregor low at the end of the year. The lower end of Lake McGregor has been drained by plugging the channel at Lomond Crossing in preparation for work to be done in the early part of 1957 which will strengthen the South Dam and improve Lomond Crossing.

#### Settlement

Thirty-two new settlers moved into the Hays area during 1956-57. Eleven of these were from the drier areas of Saskatchewan and Alberta, and nineteen were sons of farmers from the irrigated area of the Bow River Project and the Eastern Irrigation District. This brings the total number of new settlers moved on to the Bow River Project by P. F. R. A. since 1950, to 158 in the Hays District and 22 in the Vauxhall District.



Settler's effects being loaded into a boxcar for shipment to the Hays area of the Bow River Project. Ref. #12251

#### Land Development

The development of land in the Hays area for future irrigation and the reclamation of farm land in older sections of the Vauxhall area continued throughout 1956. Four new parcels of land for settlement in 1957, containing 625 acres, were broken and disced twice. All units to be settled in 1957 have been rough levelled and head ditches have been installed.

### Agricultural Activities

Eight hundred and fifty head of cattle with about 300 calves were carried from May 15, to October on 1200 acres of reclaimed pasture area north of Vauxhall. Of the 640 acres remaining to be seeded back to grass, approximately 400 are ready for seeding. The remainder requires further cultivation and the installation of a drainage system to reduce water logging and salinity. On the 2 pastures at Hays, which total 1000 acres, 750 head of cattle and 500 sheep were pastured through 1956. Some experimental work was carried on in the feeding of grain to cattle on pasture. From the results, it is expected that this type of feeding will continue on irrigated pasture.

An active weed control program was conducted during the year. A total of 1045 gallons of 2-4-5 was used in three spray machines from June 15 to August 20 to cover the project. In addition to spraying, grass was established on canal banks and borrow pits to help in the control of weeds.

Efforts to produce forage seed crops are continuing. Crested wheat and Russian wild rye grass, Ladak and Vernal alfalfa, and Lasalle clover are being grown. Yields were down in 1956 due to the older stands running out and severe winterkilling of Lasalle clover. Sodar wheat grass and Merion blue grass have been introduced to the project. Orchard grass has been abandoned as a seed crop.

Eight acres of potatoes and three acres of turnips were grown in 1956. Very satisfactory yields were experienced of both these crops. An above-ground storage for these vegetables was provided by the erection of an insulated Quonset type building. This has proved very satisfactory and it is intended to expand vegetable production and include carrots in 1957.

The Cornwall Canning Company of Taber gave out 15 contracts for the growing of beans in 1 1/2-acre lots. The yield was good and the quality of the beans was excellent. Returns were between \$350.00 and \$450.00 per acre for this crop.

### Economic Conditions

Farm prices in 1956-57 showed a slight increase over the previous year. The difficulty of marketing surplus grain crops has had the effect of forcing farmers into increasing numbers of livestock. Fairly high steady prices have encouraged the feeding of livestock on the project, and there is a tendency to extend the feeding period throughout the year.

Grain and vegetable yields were above average. Potato and corn prices were particularly good. Some damage from hail was experienced in the grain crops.



Aerial view of the irrigation pattern adjacent to the town of Hays. Note water being applied to fields in the foreground. The new school built in 1955 is shown in the background (right)

Ref. #13725

### Community Development

The town of Vauxhall continued to make gains during the year. A new 12-room school has been started and several new houses have been built. At Hays, the water system was improved and services put in for those who required them. Water and sewer lines were extended for this purpose.

### St. Mary Irrigation Project

Ten years have elapsed since P. F. R. A. first began development work to enlarge and extend existing irrigation facilities on the St. Mary Irrigation Project in southern Alberta. The original project served nearly 120,000 acres of land in the Lethbridge-Magrath-Taber districts of Alberta with water for irrigation derived from a simple diversion on the St. Mary River near the International Boundary.

With greater emphasis each year being placed on specialized crops, which need more water, and with increasing demands to bring larger areas of land under irrigation, it became clear that the present



works would be inadequate to supply all requirements. By developing suitable diversion and storage works to fully utilize Canada's share of the St. Mary, Belly and Waterton rivers, it was believed that a dependable water supply could be obtained to assure irrigation requirements for the older irrigation districts, and to extend the irrigated area to another 380,000 to 390,000 acres of land.

In furtherance to this plan, Canada agreed to assume responsibility for the financing and construction of the main reservoirs and connecting canals, and to look after all the planning, engineering and administrative work involved in the development of the project. The province on the other hand agreed to provide the funds required to finance the construction of the project's distribution system.

Works financed and constructed by the Government of Canada since 1946 include:

- St. Mary Reservoir
- Pothole Reservoir
- Ridge Reservoir
- 28 miles of connecting canal
- Belly River Diversion (under construction)

Works financed by the Province of Alberta include:

- Chin Reservoir
- Horsefly Lake Reservoir
- Rattlesnake Reservoir
- Murray Reservoir
- 194 miles of main canal
- Distribution system to serve 176,000 acres

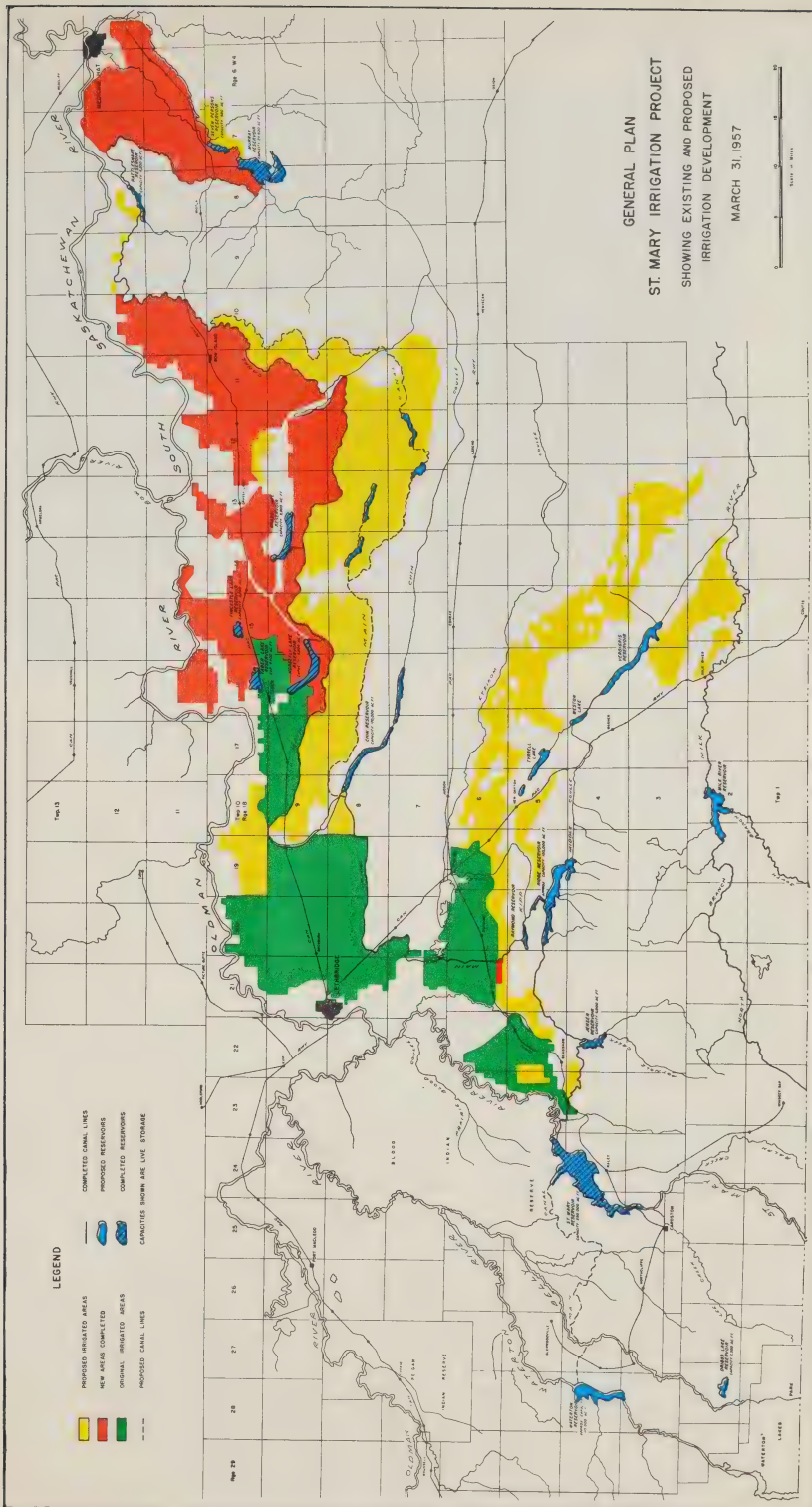
The capital funds expended under the Agreement, by the two Governments to March 31, 1957 are as follows:

Government of Canada (through P. F. R. A.)	\$18,401,000.00 (approx.)
Government of Alberta	\$16,699,000.00 (approx.)

Included in the above expenditure by the P. F. R. A. is approximately \$2,000,000.00 which was spent on engineering and administration of provincial work, leaving \$16,400,000.00 that was spent on Canada's portion of the project.

### Construction

Construction work undertaken by P. F. R. A. during 1956 included completion of North Ridge Dam which had been previously started, and the near completion of East Ridge Dam. In addition, seven contracts on the Belly River Diversion works and 22 miles of main canal were let. One of the contracts was completed during the year. Work on the remaining contracts averaged about 60% complete.







Diversion canal below inlet control gate from Belly River. In this section the river bank is used as part of the canal. Ref. #13708

#### Project Improvement

Construction work was also carried out on a number of existing structures during the 1956-57 fiscal year which in the light of operating experience, showed need of improvement. The structures on which work was carried out included -

1. Tailwater control structure below Taylor Coulee Chute.
2. Installation of radial gate at Spring Coulee underpass.
3. Replacement of 200 feet of timber catwalk in the St. Mary tunnel with concrete walkway.
4. Additional cut-off and cross drain in Taylor Coulee Chute.
5. Construction of a portion of a drainage tunnel under the St. Mary spillway.
6. Drainage outlets above 17 large drops in Division 5 (provincial)
7. Landscaping and tree planting at St. Mary camp and around the reservoir.

#### Operation and Maintenance

For the twelfth consecutive year, the normally semi-arid regions of southeastern Alberta produced a good crop of grain without



the aid of irrigation. Irrigation in the new areas of the project was confined, therefore, to irrigated pastures, hay production, and to a limited extent on specialty crops, which are beginning to make an appearance.



Pea harvesting on the St. Mary Irrigation Project, north of the town of Magrath, Alberta.

Ref. #13674

The older districts on the project used irrigation water steadily during the summer, since the specialty crops grown required much more water than even a wet year can provide from natural precipitation.

The following table shows the development of the project acreagewise, along with water consumption since 1952:-

<u>Season</u>	<u>New works constructed to serve</u>	<u>Old districts served approximately</u>	<u>Water delivered to a total of</u>	<u>Water delivered acre feet</u>
1952	37,000 ac.	118,000 ac.	130,000 ac.	186,000
1953	54,000 "	118,000 "	135,000 "	196,000
1954	96,000 "	118,000 "	158,000 "	246,400
1955	141,000 "	118,000 "	159,700 "	190,000
1956	168,000 "	118,000 "	149,000 "	202,430
1957	176,000 "			

Maintenance work included the repair of the floors of 2 drop structures in Division 5 (provincial). These floors were damaged by frost heaving during the severe fall of 1955, when temperatures dropped to 20 degrees below zero before the structure was drained. This also prompted the construction of the turnout drains previously mentioned. On the P. F. R. A. portion of the project, maintenance work was confined mostly to placing of riprap below structure, road allowance, bridge maintenance and other more or less routine work.

### South Saskatchewan River Development Project

A brief description of this project is contained in the P. F. R. A. Annual Reports of previous years. The present proposal is to develop the waters of the South Saskatchewan River to irrigate some 500,000 acres of land in central Saskatchewan. This project would also provide for power development, flood control, stream flow regulation, urban water supply, and recreation. Survey work on the Saskatchewan River commenced in 1943 to determine the feasibility of development. From an engineering standpoint this has now been established and sufficient information has been gathered to proceed with construction should it be decided to do so. During 1956 investigational work was confined to carrying on studies of a continuing nature which are of value in making minor alterations and refinements to existing engineering plans.

### Engineering Investigations

An extensive program of stream flow measurements, water elevation observations and silt sampling was continued on the South Saskatchewan River at Outlook and the North Saskatchewan River at Borden. Besides adding information to the long-term sedimentation and flow studies of the South Saskatchewan River Project, this information also assists in the sedimentation studies of the Saskatchewan River Reclamation Project.

A comparatively small amount of foundation drilling was continued at the Coteau and Summit Damsites. An additional 16,000 acres of topographic mapping in the proposed irrigable area was completed, and several small surveys were undertaken in connection with actual or potential drainage problems in the project area.

In addition to this investigational work, supervision was provided for the construction of the Lanigan Creek Diversion canal project. This project was about 60% completed in 1956.

### Pre-Development Farm

A pre-development farm has been established at Outlook to study farm practices and irrigation methods which will be invaluable to the farmer if irrigation is introduced to this area. One hundred and fifty-five acres of this farm are operated by P. F. R. A. to evaluate



Site of the proposed South Saskatchewan River dam. Flags on the west bank indicate the fill area. Ref. #13660

irrigation techniques and practices under prevailing soil and local climatic conditions, and to pre-determine problems which might arise under extensive irrigation development. The remainder of the farm consists of a 16-acre area operated by the Federal Experimental Farm at Swift Current. The detailed experimental work carried on provides valuable information on all phases of irrigation farming.

Water for both areas is delivered by pumping from the South Saskatchewan River. An approximate average of 12 inches of water was pumped over the whole farm acreage between May 15 and September 20, 1956. During the season, rainfall amounted to about 7 inches. During the summer an average of about 55 cattle were pastured on a 20-acre pasture area.

Irrigation is planned so that approximately 60% of the area is irrigated by gravity flow and 40% by the sprinkler method. A ten-year grain-grass rotation is planned for use on the land operated by P. F. R. A. A soil improvement program making use of commercial fertilizers, manure and legumes has resulted in progressive improvement in crop yields.

The relative production per acre of various crops produced on the farm in 1955 and 1956 were as follows:



<u>Crop</u>	<u>Yield per acre</u>	
	<u>1955</u>	<u>1956</u>
Hay	2.1 tons	3.4 tons
Oats	51 bus.	88 bus.
Barley	39 "	57 "
Wheat	32.8 bus.	48 "
Potatoes	415 "	407 bus.



Aerial view of pre-development farm at Outlook  
Ref. #11579

In addition to experimental field work, 96 bulls were wintered on the farm for the P. F. R. A. Community Pasture Branch, on forage and grain produced by the farm.

A concrete root cellar with a capacity of approximately 300 tons of potatoes was constructed in 1956 in time to store the potato crop. Two fields were levelled to facilitate flood irrigation.

#### Buffalo Pound Lake Reservoir

The development of the Buffalo Pound Lake Reservoir was undertaken by P. F. R. A. at the request of the Federal Government. Through an arrangement with the Province of Saskatchewan, the Government of Canada has accepted the responsibility for maintaining the water level of Buffalo Pound Lake Reservoir. This lake is used principally as a source of urban water supply for the Cities of Regina



and Moose Jaw. The Buffalo Pound Lake Reservoir will become an integral part of the overall plan of the South Saskatchewan River Development, should this project be undertaken.

The development of this project, pending construction of the South Saskatchewan Dam, involves the pumping of water from the South Saskatchewan River at Elbow, a vertical distance of 107 feet, over a height of land which separates the South Saskatchewan River from the Qu'Appelle Valley. From this point it is delivered to the summit of Qu'Appelle River through a 12 mile canal. In addition, 48 miles of minor channel improvement work is required along the Qu'Appelle Valley between the end of the canal and Buffalo Pound Lake, to improve the flow characteristics of the Qu'Appelle River through that area.

The land around Buffalo Pound Lake Reservoir was expropriated in the name of Canada up to an elevation that would suffice to protect Canada from claims for damages resulting from the higher water levels required to meet Canada's commitment, and also to enable the full use of local river flows of the Qu'Appelle River and Moose Jaw Creek. The controlled water levels has resulted in a surge of summer resort development around the Reservoir.

### Surveys

A right-of-way survey was completed for the 9.7 miles of canal built under Contract #1 from Pumping Station #2 to the summit of the Qu'Appelle Valley. Profile and alignment surveys were conducted along a 6-mile stretch of this canal. The usual offset control lines and bench marks were maintained to guide construction on Contracts #2, 3, 4 and 5.

### Construction

- Contract #1 - Construction of 9.7 miles of canal from Pumping Station #2 to the summit of the Qu'Appelle Valley was completed in October 1955.
- Contract #2 - Work on this contract covering the construction of 2.8 miles of canal and appurtenant works between Pumping Station #1 and #2 was about 90% completed in 1956.
- Contract #3 - This contract covering the construction of 3 miles of new channel and 2 concrete drop structures between the summit of the Qu'Appelle Valley and the point where Ridge Creek joins the Qu'Appelle Valley, was partially constructed in 1955, and about 90% completed at the cessation of work in 1956.
- Contract #4 - Progress on this contract covering the installation of a 7-foot culvert under the large C. P. R. earth fill, which crosses the Qu'Appelle Valley near Aitkow, was very slow and it eventually had to be completed by P. F. R. A. crews in March 1957.





Contract #5 - This contract covering the construction of an intake on the South Saskatchewan River, and 2 pumping plants, was commenced in 1956 and was about 55% completed by March 1957.

Other construction on the project consisted of the widening and cleaning of about 2 miles of Qu' Appelle River channel below Eye-brow Lake, flattening and shaping spoil banks along the Qu' Appelle River, and seeding of crested wheat grass on 2 miles of canal banks and waste areas on Contract #2, and the borrow pit area on Contract #1.

### Saskatchewan River Reclamation Project

Between Tobin Rapids in Saskatchewan, and The Pas in Manitoba, the Saskatchewan River has formed a large, marshy delta. It has been estimated that this region, now under study by the Saskatchewan River Reclamation Project, contains approximately 1.5 million acres of potentially arable land. The 135,000 acre Pasquia Area, presently being developed southwest of The Pas, is expected to yield about 100,000 acres of arable land. For purposes of description, the portion of the project lying outside of the Pasquia Area is referred to as the Sipanok Area.

#### SIPANOK AREA

Topographic surveys on various streams through the Sipanok Area were continued this year. Hydrometric surveys, pertaining to the discharge of water and sediment into and through the delta between Tobin Rapids and The Pas, were also carried out. In addition, bathymetric surveys were completed on ten sections of the Saskatchewan River, as well as on the whole of Cumberland Lake. All these surveys are necessary parts of the investigation program required before engineering plans for possible reclamation work can be formulated.

#### PASQUIA AREA

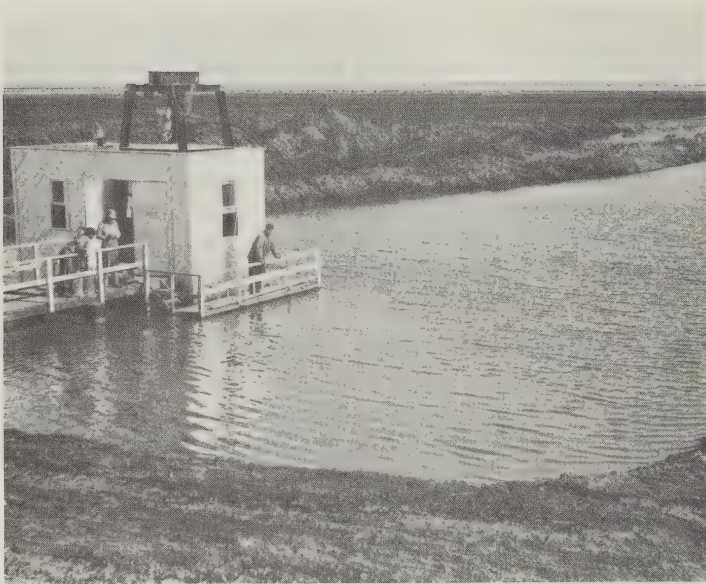
##### Surveys

During 1956 the survey work in this area consisted of establishing lines and grades for the construction of eleven miles of dikes, twenty-five miles of drains and a pumping plant.

##### Operation

The Diversion Dam on the Pasquia River upstream from The Pas diverts the flow of the Pasquia River into the Carrot River drainage system. The Pasquia River channel below this dam now serves as a drainage canal for the Pasquia Project. Between July 12 and freeze-up, 1956, approximately 400,000 acre feet of water was discharged through the Control Dam at the outlet of this canal.





Mile 14 pumping station at high water level  
Ref. #13404

To prevent flooding of cultivated lands and to facilitate drain construction in Twps. 55, Rge. 28, two pumps were installed to discharge the runoff into the Carrot River.

#### Field Investigations

Water level gauges indicated the need for further improvement of the Salt Lake Diversion to permit a more effective draw-down of the reservoir created by the Pasquia Diversion Dam. Twelve piezometers were installed in 1956, and twelve more are to be installed in 1957 as other parts of the project become accessible. Between April and November 1956, 7.88" of precipitation were measured, compared with the 32-year average of 9.90". The frost-free period was 112 days. Sub-surface investigations to obtain information about the potential supply of domestic water from deep wells, and concerning the possibility of draining surface depressions into unsaturated substrata, were done at the request of the Manitoba Lands Branch.

#### Construction

Twenty-four miles of dike was constructed along the Carrot River from the Control Dam on the Pasquia River channel near The Pas to the Diversion Bridge over Salt Channel. This completed the construction of the main protection works.







Wheat grown on reclaimed land in the Pasquia Area, showing the stand and stage of maturity on August 22, 1956. Ref. #11827

The drainage system in Twp. 55, Rge. 28 has its outlet in the Carrot River. Gravity drainage from the area is not possible ninety percent of the time. A portion of the normal runoff can be stored in several lakes within the project. To take care of excessive runoff which cannot be stored effectively, a pumping plant with a capacity of fifty c. f. s. was installed during 1956.

Some eight miles of drain was completed during the year and about 140,000 cubic yards of earth excavated under the drain-dike contract. This work is to be completed in 1957. The downstream face of the Control Dam and the exposed wave-eroded side slopes on the Salt Channel were given a protective coat of gravel.

#### Miscellaneous Construction

Some 120,000 cubic yards of drainage excavation was done under rental rates due to the scattered locations of some of the smaller drains. Two culverts each four feet in diameter and ninety feet long were installed through the Mile 12 road. Twenty-two miles of Carrot River dike right-of-way not taken up by the dike, berm or borrow pit, were made ready for the seeding of forage crops. Bulldozers trimmed and levelled one mile of spoil banks. Eighteen hundred cubic yards of glacial clay was stockpiled for the construction of control structures. A new campsite was constructed at the entrance to the project. The



Indian Reserve borrow pit was levelled and grassed. A twenty-five hundred foot access road was constructed from the Carrot River road to the Mile 14 Pumping Plant.

### Assiniboine River Project

Frequent flooding by the Assiniboine River in recent years has resulted in entire communities suffering damage to land, buildings and other property. In 1950, the responsibility for the diking and cut-off program along this river between Portage La Prairie and Winnipeg, was transferred from the Department of Public Works to the Department of Agriculture. For convenience, the watershed has been divided into the Upper Assiniboine, lying upstream of Portage La Prairie, and the Lower Assiniboine, extending downstream from Portage La Prairie to Headingly, Manitoba.

#### UPPER ASSINIBOINE RIVER

##### Surveys

Surveys were continued during 1956 to determine the feasibility of using headwater storage as a means of controlling flooding on the Lower Assiniboine River. Possible damsites on the upper reaches of the Assiniboine and its tributaries were located by field and office investigations.

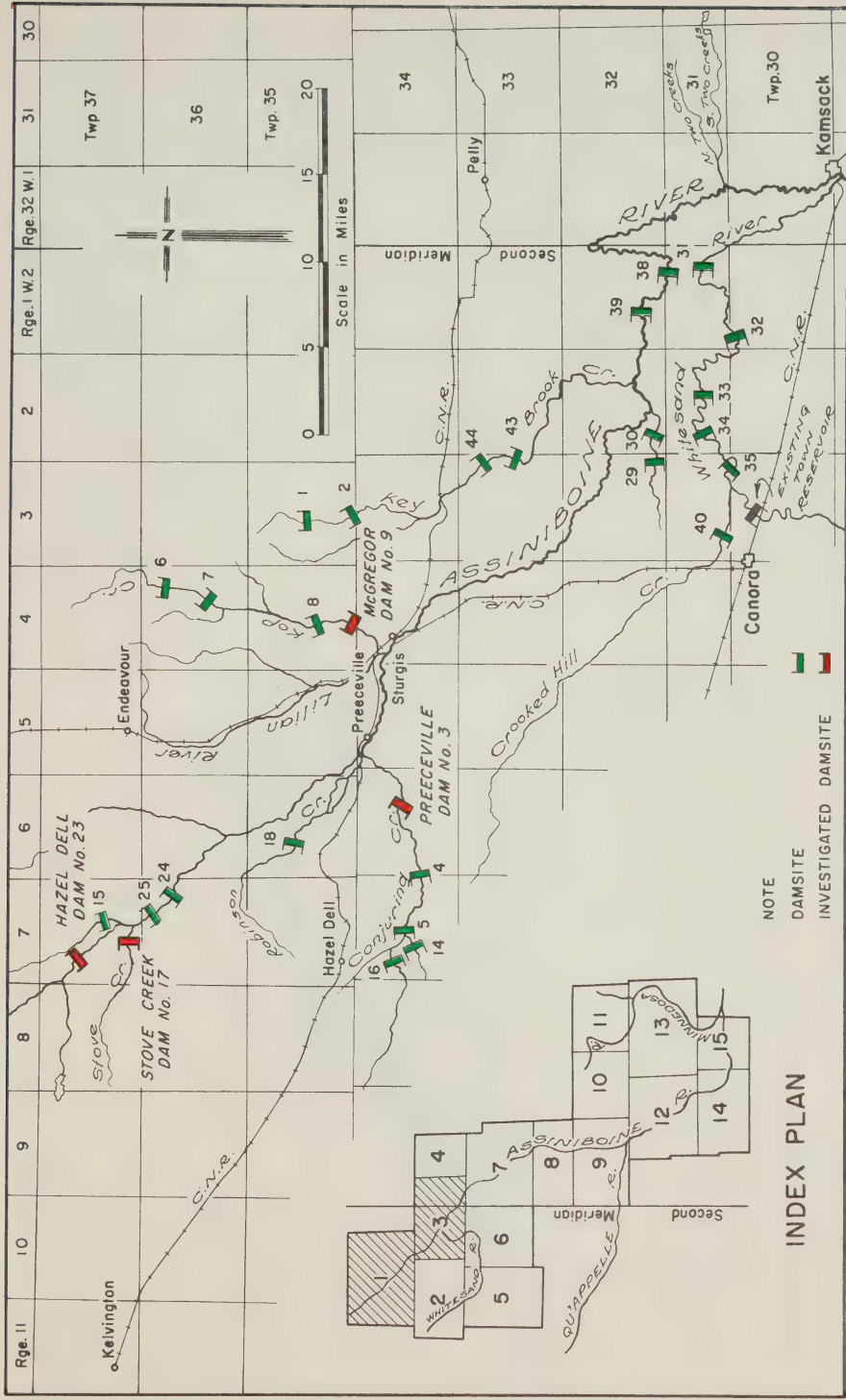
##### Construction

During 1956 the Miniota diking system on the Assiniboine River was completed. This six-mile length of dike, located on the north side of the river near Miniota, was designed to protect 1,200 acres of cultivated land from flood flows of 20,000 c.f.s. In addition, several small bank breaks were repaired in widely separated locations along the Assiniboine River from Virden, Man., to Kamsack, Sask.

#### LOWER ASSINIBOINE RIVER

##### Surveys

Flood control measures along the Lower Assiniboine River consist of the construction and maintenance of an extensive diking system combined with river cutoffs. Prior to 1950 no effort had been made to establish a uniform design height for the dikes. During the four years from 1951 to 1954, an attempt was made to build dikes which would provide more or less uniform protection. Gauges were established to check the design height of the diking system in 1955 and 1956. Topographic surveys were completed for the design of two additional river cutoffs which are being considered for construction in 1957.



NOTE  
 DAMSITE  
 INVESTIGATED DAMSITE

# INDEX PLAN

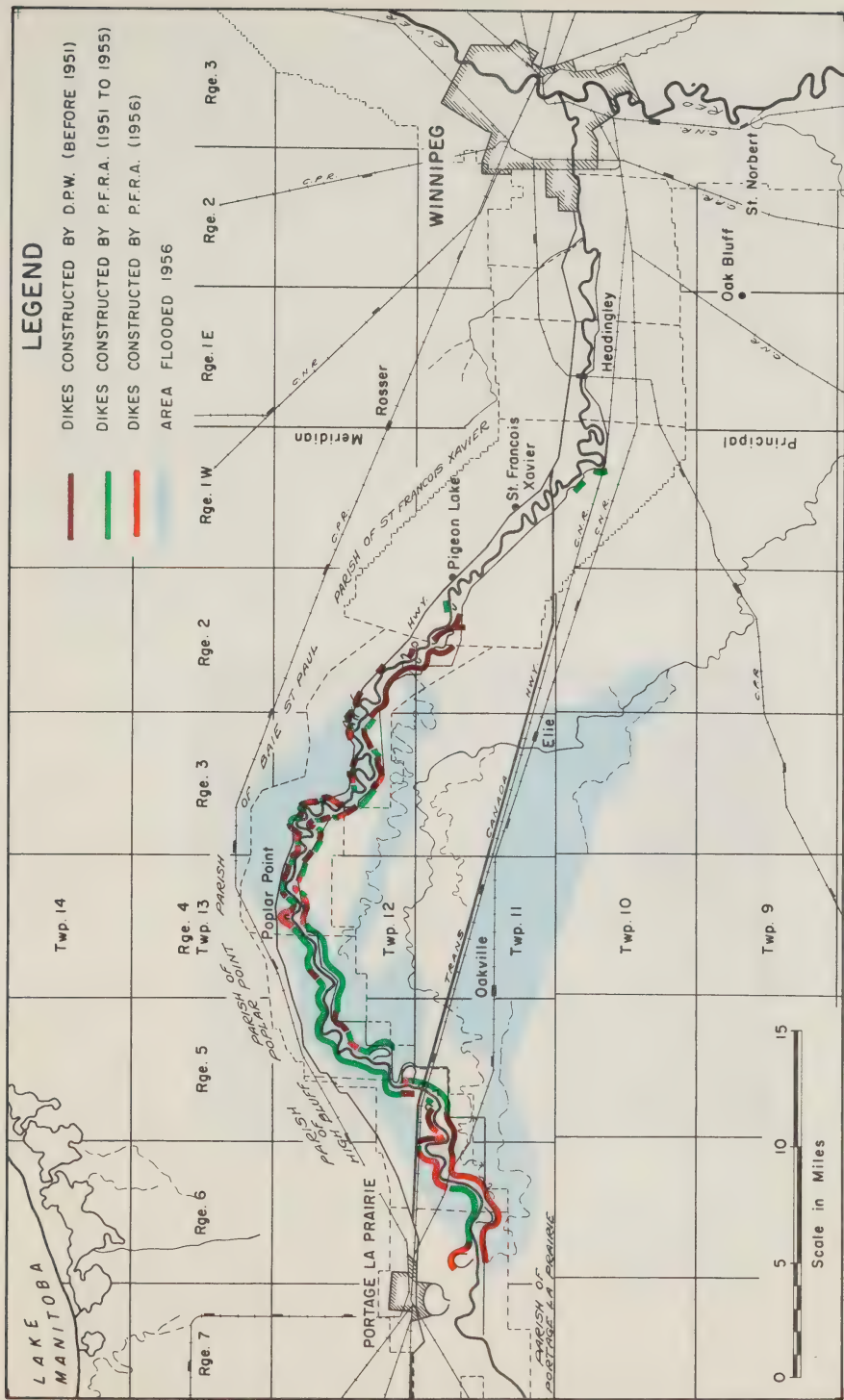
PLATE XII

DEPARTMENT OF AGRICULTURE - CANADA  
 P.F.A.

## UPPER ASSINIBOINE RIVER PROJECT PROPOSED DAMSITE LOCATIONS

MARCH 31, 1957





DEPARTMENT OF AGRICULTURE - CANADA  
P.F.R.A.

# LOWER ASSINIBOINE RIVER PROJECT DIKING AND FLOODED AREA 1956

MARCH 31, 1957





### Construction

In the seven-year period since P. F. R. A. has been responsible for flood control on the Assiniboine River, about fifty miles of new dikes, four river cutoffs and several miles of maintenance and repair work have been completed at an average annual expenditure of \$90,000.00. Ten miles of new dike and the Sayers Creek Control Dam were completed in 1956. Improvement and maintenance on about ten miles of dike in the vicinity of Ross Cutoff was completed on a machine rental basis.

### Flooding

A record snowfall during the winter of 1955-56 created conditions for an above-average spring runoff. The rapid rise in the river during breakup and the attendant severe ice jams caused several breaks in the dikes between Portage La Prairie and Winnipeg. Fortunately, a slow melting period over the entire basin permitted the ice to clear out of the river and emergency repairs were made to the five major breaks before the flood crest from the Upper Assiniboine reached this area. Several minor weak spots required sand-bagging and reinforcing during the passage of the flood. The peak crest recorded at Portage La Prairie was 19,000 c.f.s. on May 21, 1956.



Ross cutoff on the Assiniboine River, six miles east of Portage La Prairie. Railroad bridge and new Trans Canada Highway bridge in middle background.

Ref. #12743

## North West Escarpment Reclamation Project

Under an Agreement between the Province of Manitoba and the Government of Canada, P. F. R. A. has carried out a program of investigation and construction to relieve the flood and erosion problems caused by the streams and rivers flowing off the northern and eastern slopes of the Riding and Duck Mountains.

### Surveys

No major surveys directly connected with the project were carried on during 1956. Apart from the required construction surveys, three miles of topographical survey was completed on the North Pine River.

### Construction

A fairly extensive program of stream bank protection and flood damage repair was undertaken this year. The bulk of this work consisted of placing rock riprap in eroded banks, on flood-damaged weirs, and adjacent to undermined bridge and culvert installations on the Edwards and Mink Creeks and on the Wilson River.

Considerable damage was caused to the Edwards Creek drain by a flash flood which occurred in June. Three weirs and nine bridges on the drain required attention as a result of the flood. In an attempt to prevent flood-borne debris from entering the main drain in future, a timber diversion structure was built in the silting basin above the main weir. Other improvements on the Edwards Creek included repairing structural damage to the bridges, widening and protecting the natural channel above the silting basin, improving local drainage adjacent to the diking system, and installing steam pipes in two culverts under the floodway dikes.

Rock riprap protection was placed on ten banks throughout the lower fifteen miles of the Wilson River, one bridge was protected and a two mile length of borrow pit drain was dug at the downstream end of the system.

Three eroding banks on Mink Creek Drain were riprapped at the close of the construction season.

In preparation for control work proposed for 1957, two separate right-of-way clearing jobs were completed during the winter months. These were on the Mineral Creek and Fishing River, where six and seven miles respectively of hand clearing, 100 feet in width were completed.

## British Columbia Projects

The activities of the Prairie Farm Rehabilitation Administration in British Columbia during 1956-57 have involved the supervision of operation and improvement on projects already constructed for the

- 101 CARIBOO WILDLIFE PROJECT NO. 2  
 X 102 TRANQUILLE FARM  
 • 103 JOHNSON—WESTERN CANADA RANCHING NO. 1  
 • 104 JOHNSON—WESTERN CANADA RANCHING NO. 2  
 • 105 CHASE FLATS  
 • 106 PENTICTON WEST BENCH  
 X 107 LILOOET VALLEY RECLAMATION  
 X 108 KAMLOOPO FLATS  
 • 109 KAMLOOPO EXPERIMENTAL FARM  
 • 201 BAYHEAD  
 • 202 WESTERN BENCHES  
 • 203 WESTERN BENCHES  
 • 301 PENTICTON WEST BENCH EXTENSION  
 • 401 B.C. FRUITLANDS IRRIGATION DISTRICT  
 • 402 KITIMAT  
 X 403 CUISSON CREEK  
 X 404 COWICHAN

- X 405 QUESNEL TO WILLIAMS LAKE  
 ▲ 406 WILLIAMS LAKE TO LYTTON  
 ▲ 407 LYTTON TO KAMLOOPO  
 ▲ 408 KAMLOOPO TO CLEARWATER  
 ▲ 409 KAMLOOPO TO CHASE  
 ▲ 410 HARRISON LAKE FLOOD CONTROL  
 ▲ 411 UPPER MCGREGOR—FLOOD CONTROL and POWER  
 ▲ 412 LOWER MCGREGOR—FLOOD CONTROL and POWER  
 ▲ 413 WILLOW RIVER—FLOOD CONTROL and POWER  
 ▲ 414 GISCOME CANYON—FLOOD CONTROL and POWER  
 ▲ 415 BOWRON LAKE—FLOOD CONTROL and POWER  
 ▲ 416 ISAAC RIVER—FLOOD CONTROL and POWER  
 ▲ 417 CARBOO RIVER—FLOOD CONTROL and POWER  
 ▲ 418 HOBSON LAKE—FLOOD CONTROL and POWER  
 ▲ 419 CLEARWATER RIVER—FLOOD CONTROL and POWER  
 ▲ 420 MURTLE RIVER—FLOOD CONTROL and POWER

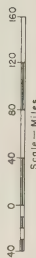
PRINCE RUPERT • TERRACE

- .....DENOTES PROJECTS UNDERTAKEN FOR V.L.A.  
 X.....DENOTES PROJECTS UNDERTAKEN FOR PROVINCIAL GOVERNMENT.  
 ▲.....DENOTES PROJECTS BEING INVESTIGATED FOR FRASER RIVER BOARD.

# PROJECT STATUS

- 100.....CONSTRUCTION COMPLETED.  
 200.....CONSTRUCTION COMPLETED, UNDER SUPERVISORY OPERATION AND IMPROVEMENT.  
 300.....PROJECTS UNDER CONSTRUCTION.  
 400.....PROJECTS UNDER CURRENT INVESTIGATION.

## 1956-57 INDEX MAP SHOWING LOCATION OF LAND RECLAMATION AND IRRIGATION PROJECTS IN BRITISH COLUMBIA MARCH 31, 1957







Veterans' Land Act, the development to construction stage of one new Veterans' Land Act project, and the investigation of five special projects - two for Veterans' Land Act, two sponsored jointly with the Government of British Columbia, and one for the Department of Indian Affairs. In addition, damsite surveys and geological investigations were continued in connection with storage and power proposals for the Fraser River Board.

#### PROJECT OPERATION AND IMPROVEMENT



Progress shot of V. L. A. settlement and irrigation development on the Westbank Project near Kelowna, B. C. Ref. #11820

#### Westbank

Eleven Hundred acres of bench lands lying directly across Okanagan Lake from Kelowna is divided into 72 full-time farms and 53 small-holding units. Construction was completed on this project in 1950.

Water is obtained from Bear Creek and is conveyed by canal and flume to a storage reservoir located in Rose Valley. The water is distributed to the project lots by 70,000 lineal feet of spiral welded steel pipe, varying in size from 4 to 24 inches in diameter. Electrolytic corrosion occurred in the pipe within a year after installation, and it became necessary to apply cathodic protection to all pipe lines. This protection program was completed in 1955.

#### Bankhead

The Bankhead project, constructed in 1951 to provide sprinkler irrigation by pumping from Mill Creek to 58 small holdings of one acre in size, has been operated successfully since completion.

Consideration is now being given to the feasibility of supplying water to an adjoining 75 acres of orchard land. This would enhance the district's operational revenue. Engineering assistance will be provided in the preparation of a preliminary report on the estimated cost and power required for this proposed extension.

#### Cawston Benches

The Cawston Benches, consisting of 624 acres, subdivided into 52 full-time farms, are situated on the Similkameen River bench lands three miles south of Keremeos. Water from the river is supplied by 4 deep-well turbine pumps with a total capacity of 5100 U.S. gallons per minute.

As a result of the heavy load of silt carried by the Similkameen River during high water stage, a settling basin was constructed north of the pumphouse several years ago. During the past year repairs have been carried out to ensure water being diverted through this settling basin during high water stage. It is planned during the 1957 irrigation season to conduct pumping tests along the base of the bench adjacent to the main canal, to determine the feasibility of obtaining a ground water supply from this area rather than the river.

### PROJECT CONSTRUCTION

#### Pentiction West Bench Extension

This project, situated west of the city of Pentiction, consists of 205 acres divided into 94 small holdings. Water for domestic and irrigation use is pumped from the Okanagan River by means of 3 vertical turbine pumps with motors of 40, 50 and 75 horsepower, capable of delivering 1100 U.S. gallons per minute against a 40-foot head.

Completed in May 1954 this project was fully settled by September 1955. A request that new land adjacent to the original project be developed, was submitted by Veterans' Land Act officials. Location surveys, plans and reports were completed, tenders were let, and construction was under way by the end of the 1956-57 fiscal year. This extension requires a 150-horsepower pump to be added to the pumping plant, which will make available an additional 84 small holdings to the Pentiction West Bench project.



Cawston Benches, south of Keremeos, B.C. before irrigation was established in this area. Ref. #1173



Comparison picture of the same area showing V. L. A. settlement and orchard development as a result of irrigation.

Ref. #13330



## INVESTIGATIONS

### Veterans' Land Act

Two projects were proposed for study by Veterans' Land Act. The B. C. Fruitlands Irrigation District, an area of some 2900 acres northwest of the village of North Kamloops, has been supplied by gravity water from Jamieson Creek with supplementary water pumped from the North Thompson River. The system has been in operation for over forty years and must now be replaced if irrigation is to continue in that district.

A preliminary survey and report for a closed pipe pressure system supplied by pumping from the North and South Thompson Rivers was prepared by P. F. R. A. in 1952, but no action was taken on this proposal. During the past year, P. F. R. A. has given engineering assistance in the preparation of plans for the gradual renewal and replacement of the present gravity system with a full pressure system to supply domestic as well as irrigation water from the North and South Thompson Rivers.

The second investigation completed during 1956 was of a proposed small-holdings project adjacent to the city of Kitimat. The preliminary survey plan and report of subdivisions, road requirements, drainage and clearing problems, and a pumping station and pipe distribution system were completed this year. This project, based on current negotiations between the Veterans' Land Act and the Aluminum Company of Canada, is to provide suitable small-holdings building sites for the benefit of Veterans employed in the new aluminum smelter operation at Kitimat. The site of this project lies 2 miles north of Kitimat on the Terrace highway which is now under construction.

### Provincial Government of British Columbia

The Cuisson Creek project, a provincial proposal for the irrigation of 2680 acres of river benches along the Fraser River 20 miles south of Quesnel, was investigated during 1956. Water would be diverted from Cuisson Creek and delivered in closed conduits with sufficient head being available for sprinkler irrigation.

A preliminary survey and report was completed but held in abeyance, pending clarification of water resources. Further records have now been obtained on the flows of this stream and a field inspection has been made to evaluate the proposed storage site. At the close of the year this project was under study by the Water Rights Branch of the Government of British Columbia.

The other investigation undertaken for the provincial government was in an extensive area of 35,000 to 45,000 acres adjacent to Duncan on Vancouver Island which could be irrigated from the Cowichan River, with storage in Cowichan Lake. No work has been done on this project to date except the compilation of statistical data on land ownership and water resources.

## Department of Indian Affairs

The Department of Indian Affairs requested a reconnaissance report on flood control of the Cowichan and Kobsilah Rivers which traverse the largest Reserve on Vancouver Island. A full-scale topographic and hydrographic investigation is now pending as a result of this reconnaissance report.

## Fraser River Board

The Fraser River Board, a joint agency of the Provincial and Federal Governments, is charged with preparing a report on power potential and flood control of the entire Fraser River system.

For the past four years, P. F. R. A. has provided engineering services for compilation of topographic maps, and more detailed investigations into the site areas of dams required for power development and flood control.

During the past year, the P. F. R. A. carried out area surveys of eight damsites on the Murtle River, a tributary of the Clearwater River; on the Cariboo River (or North Fork of the Quesnel River) east of Quesnel, B.C.; and on the Willow River twenty miles east of Prince George.

In addition to field survey, Office Air Photo Appreciations of forty-two damsites were carried out by the Air Photo Analysis and Geological Engineering Division of P. F. R. A.

To indicate the scope of the work carried on since 1950 for the Fraser River Board the following summary has been compiled:-

1. Number of power sites surveyed	- 19
2. Potential horsepower at these sites	- 635,000
3. Number of damsites - reconnaissance and photo appreciation only	- 32
4. Number of damsites - storage only surveyed	- 4
5. Total water storage involved in all sites	- 8,300,000 ac. ft.
6. Reconnaissance of irrigation potential by pumping	- 66,893 acres

## ENGINEERING SERVICES

For many of its projects P. F. R. A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is seldom available from outside sources, the organization has set up a number of Divisions under the general heading of Engineering Services.

## Hydrology Division

This Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P. F. R. A. projects. In general, the studies undertaken may be classified under three headings: flood potential determinations, water supply and utilization studies for specific projects, and water supply and utilization studies on broad watershed bases. In addition, the Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies, provides information for the Canadian section of certain international engineering boards established under the International Joint Commission, and does minor studies of varying character for other Branches and Divisions of P. F. R. A.

During the 1956-57 fiscal year, the flooding potential at various damsites was studied and reported upon. These included the McKinnon Weir, Pothole Dam, Boisevain Dam and at the proposed Deloraine, Sarnia, Rivers and Fallen Timber damsites. In addition, reports on floods prepared by other Divisions of P. F. R. A. were reviewed with particular attention being given to the Waterton and Whitemud River projects.

Water supply studies were undertaken for a number of specific proposed projects including the Radville, Kerrobert, Fallen Timber and Upper Assiniboine projects.

Studies on a general watershed basis were continued during the year in order to present an overall picture of future water supply and utilization in selected drainage basins. Studies of this character which were undertaken this year are as follows:

Hydrology Report #15 - "Water Supply and Utilization in the Ross Creek Basin", November 1956 (completed)

Hydrology Report #16 - "Hydrology of Carrot River Floods", August 1956 (completed)

Hydrology Report #17 - "Water Supply and Utilization in the Wascana Creek Basin" (nearly complete)

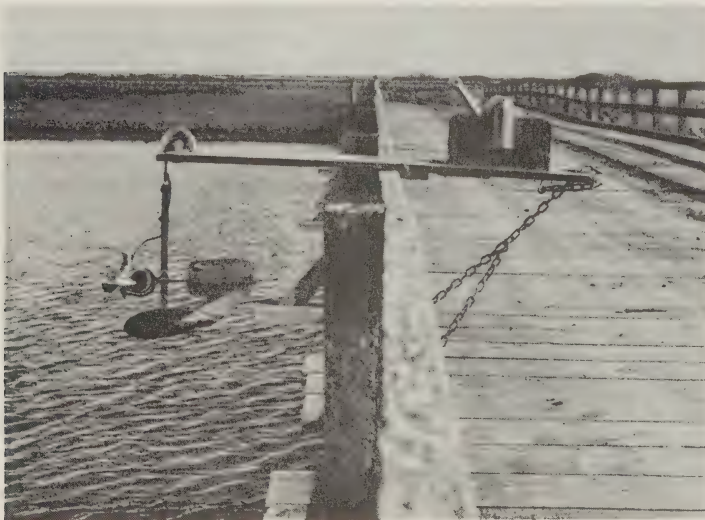
Hydrology Report #18 - "Qu' Appelle Basin Floods of 1956",  
October 1956 (completed)

Hydrology Report #19 - "Use of Water in the Qu' Appelle  
Watershed", March 1956 (completed)

Hydrology Report #25 - "Preliminary Estimates of Flood  
Frequencies in the Riding Mountain  
Area", November 1956 (completed)

Of particular interest is the series of eight reports covering the Qu' Appelle River Watershed which will be completed in 1957. These reports will deal with various phases of the supply, utilization and control of water resources in this basin. Within this series, Hydrology Reports Nos. 12, 18 and 19 have been completed while Reports Nos. 20 to 24 inclusive are well under way.

Another study now initiated deals with the Pipestone Creek Watershed and this should be completed during the following year.



Stream-flow measuring equipment being used to  
check unusual flood conditions in the Quill Lake  
area. (Saskatchewan) Ref. #13523

During the year this Division also (a) advised on international hydrometric data collection on the eastern tributaries of the Milk River, (b) advised on the measurement of irrigation water and operating procedures on the irrigation projects in the Cypress Hills, (c) co-operated with the Swift Current Regional Office in inspecting private projects in



the Cypress Hills on behalf of the Provincial Government, (d) co-operated with the Swift Current Office in organizing information necessary for the Saskatchewan Water Rights Office with respect to the irrigation projects in the Cypress Hills (e) advised the Kamloops Regional Office on certain hydrology problems, (f) advised the Saskatchewan Civil Defence Office, Saskatchewan Water Rights Office, the City of Regina and various Rural Municipalities on 1956 spring flood hazards and forecasting, (g) supplied basic data to the Alberta Water Resources Office, (h) co-operated with the Swift Current Experimental Farm on the operation of the Davin Hydrology Research Station and (i) also carried out snow surveys to forecast spring runoff volume in connection with the operation of Buffalo Pound Lake in the Qu'Appelle Valley. In addition, the Division was represented on the P. F. R. A. Pasture Improvement Committee and initiated certain basic hydrologic studies pertinent to the development of standard hydrologic estimating procedures.

Studies of various character were supplied throughout the year to the Prairie Provinces Water Board. In particular, (a) close co-operation was given to the Federal Agricultural Economics Division and their work for the Water Board regarding various aspects of the allocation of waters among provinces, as well as (b) carrying forward a study of moisture deficiencies and surpluses on the Canadian Prairies; this work is being undertaken in detail by a member of the staff of the Division of Geography, University of Alberta.

Studies were also undertaken for the Canadian Section of the international Souris-Red Rivers Engineering Board for the International Joint Commission, with particular emphasis given to possible future development within the Souris River Basin.

#### Soil Mechanics and Materials Division

The Soil Mechanics and Materials Division carries out studies and provides technical advice in connection with foundations, soils, concrete and other materials associated with earth dam and water development projects. In the investigation stages this involves field exploration, sampling and laboratory testing. Based on this data, design studies are carried out which provide the basic information for the final design of structures. In the construction stage further detailed exploration is required along with construction control, additional testing, and the installation of special test apparatus. With the project in service the test apparatus is utilized to indicate the performance of the structures and to ensure that seepage or deformation does not exceed tolerable limits.

During the year investigational work was carried out at 62 sites. Major projects included: the completion of investigations at Boundary Dam, exploration in the Assiniboine River Basin, further work on the Red Deer Project, and the completion of exploratory work

at Waterton Damsite No. 3. In total 65,000 feet of test holes were drilled and 12,000 samples were taken with drilling and sampling equipment of the Division.

Projects in the construction stage for which the Soil Mechanics and Materials Division provided construction control and field testing services included: the Canal on the Buffalo Pound Lake Water Supply Project, Boundary Dam, LaFleche Dam, Hugonard Dam, Adair Creek Dam, East Ridge Dam, North Ridge Dam, the Belly River to St. Mary Canal on the St. Mary Project, miscellaneous structures in Saskatchewan and on the Bow River Project in Alberta, and the Rock Lake Dam in the Eastern Irrigation District.

The Boundary Dam, a Saskatchewan Power Corporation Project for which P. F. R. A. is providing complete engineering services on a reimbursable basis, is of special interest from a soil mechanics standpoint due to the many difficult problems involved. This water storage project, planned by P. F. R. A., consists of an earth dam 90' in height. It is located on Long Creek near Estevan in southeastern Saskatchewan and is being built for the purpose of providing cooling water for a steam power plant. Two difficult problems associated with this dam are the cut-off required to intercept seepage through pervious coal layers in the abutments, and the stability of a portion of the embankment located above an area containing soft plastic clay in the foundation. From exploration elsewhere in the area, it was expected that the coal layers would be very pervious. Consequently, pressure tests and other water tests were carried out to verify the degree of perviousness. As a means of solving this problem, it became clear that an unusually deep cut-off would have to be used to intercept the coal layers immediately adjacent to the dam. In addition, drainage tunnels and horizontal drains and relief wells are being used to relieve pressure downstream from the embankment. Piezometers and standpipes will be installed to determine the effectiveness of these devices.

Three methods were considered to improve the stability. The first involved removal of the unstable material from the building area which would delay construction and result in a substantial increase in cost. The second method involved what is called "stage construction" or in other words, adding the embankment load over a period of several seasons. However, this would also delay completion of the project. The third method was to accelerate the settlement and gain in strength of the foundation by the use of vertical and sand drains to permit escape of water squeezed from the soil as it was loaded. As time was a very important consideration in connection with this dam, the last method was adopted in combination with the stage method of construction. Even with these two expedients, the stability of the structure may be no more than adequate based on predictions from laboratory tests. Therefore, very extensive test apparatus to measure settlement, deformation, and water pressures, have been installed and construction is being proceeded with on a design as you go basis to ensure that a safe and yet as economical a structure as possible, will be built.



Columbo Plan student assisting P. F. R. A. soil mechanics engineer at Boundary Dam, to set settlement gauges. Ref. #12244

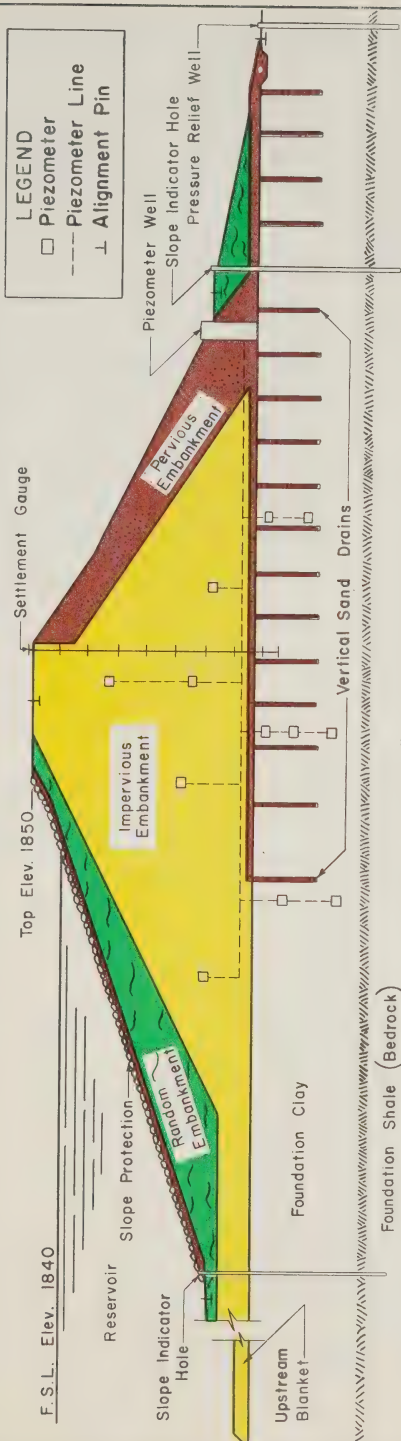
Plate XV contains a cross section of the embankment and the valley profile at the dam centerline. The embankment cross section shows the different types of material in the earth fill dam and the test installations that have been incorporated into the design. The valley profile drawing illustrates the various materials encountered in the foundation, which include sand and soft clay in the valley bottom and coal and bedrock materials in the abutments and below the sand and clay.

Test apparatus installed in other earth structures described in previous reports, was observed at intervals throughout the year. The results of these determinations are providing valuable information to be utilized in the design and construction of future projects.

Practical research projects to study conditions peculiar to water development in Western Canada are also being continued. They involve investigations of highly plastic clays, clay shales, canal lining materials, western concrete aggregates, local cements, concrete repair, winter concreting, and flexible metal conduits. Papers have been presented covering the first and second items and a paper covering canal lining studies is now being prepared.

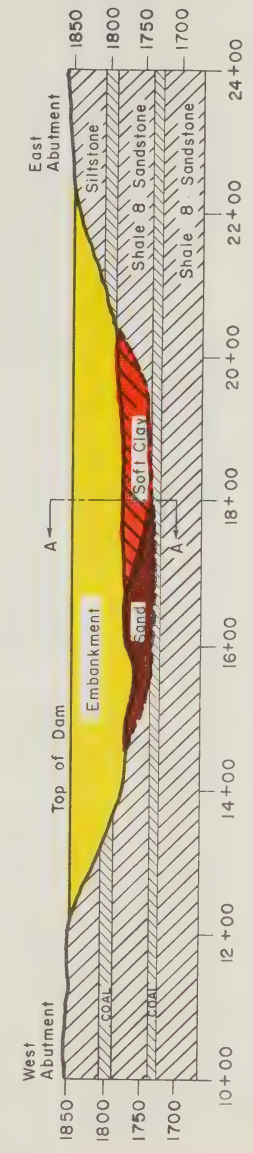
Other services rendered during the year by the Soil Mechanics and Materials Division included investigational work carried out for the Federal Department of Public Works, the Department of National Defence and the Province of Manitoba and development work for the Drainage Division and Community Pasture Branch of P. F. R. A.





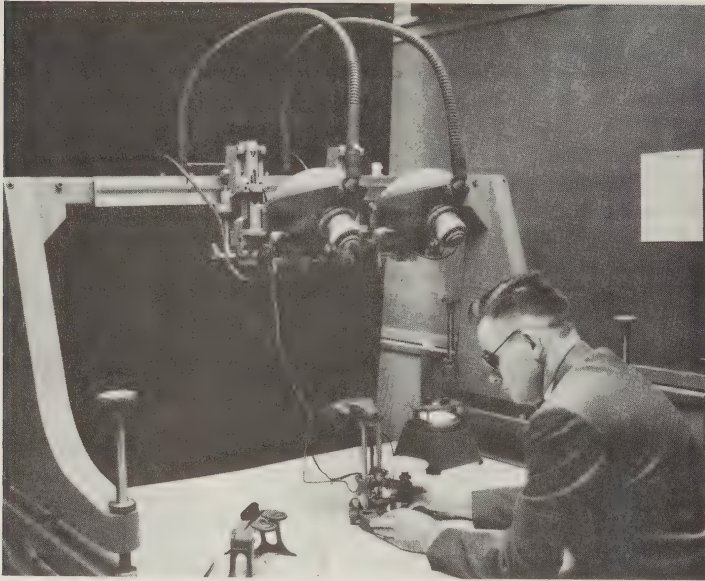
Scale: 1" = 50'

BOUNDARY DAM CROSS SECTION A-A  
SHOWING  
TYPES OF TEST INSTALLATIONS



VALLEY PROFILE AT DAM CENTERLINE





Balplex stereo-plotting machine used for the compilation of topographic maps.

Ref. #13799

During the year, the Division produced a total of 454 standard township mosaics; 127 of these were made for the community pasture improvement program; 241 were made for the Division studies on the Assiniboine River Basin, and the remaining 86 were distributed over various other projects. Three fully controlled mosaics, each covering a scaled distance of 25 miles, were made of the Lillooet Valley in British Columbia.

#### Design Division

Activities of the Design Division include:-

- (a) The design and production of drawings for all major engineering works and structures.
- (b) The preparation of specifications and calling for tenders on the construction of large projects.
- (c) The handling of problems arising out of construction which requires special advice or research.
- (d) The inspection and study of maintenance, reconstruction or modification problems which arise from time to time in connection with existing projects.
- (e) The provision of print reproduction services.

During the year, the Division provided engineering plans and specifications for 20 new contracts having a total value of over \$4,600,000.00. Included in this figure was a contract for \$1,500,000.00 for the construction of Boundary Dam, a project being undertaken by the Saskatchewan Power Corporation on Long Creek 2 1/2 miles south of Estevan, for which P. F. R. A. is providing complete engineering service on a reimbursable basis.

Work undertaken by the Division for the Power Corporation on this project has included the design of the earthfilled dam, design of the reinforced concrete spillway and outlet structure, preparation of plans and specifications on construction, and field engineering inspection. As mentioned in the Soil Mechanics section of this report, one of the main problems involved in the design of Boundary Dam was to plan an effective cut-off for seams of coal in the dam foundation.

In Alberta, the Design Division continued in 1956 to give service to the Government of Alberta in connection with irrigation development work being undertaken by that Province in sections of the West Block of the Bow River Irrigation Project. Some 4 different contract units were completed for the Alberta Government during the year, having an estimated value in excess of \$800,000.

The Hydraulic Section of the Design Division carried out an increased number of field tests during 1956. Such tests made on full scale structures in the field are desirable to complement studies made on small scale models in the Hydraulics Laboratory. These field tests included:-

- (1) Velocity and jump height determination on Travers Reservoir Chute inlet in July.
- (2) Performance tests on Duncairn Conduit outlet in August.
- (3) Chute velocity determinations and performance tests on Ronalane Wasteway in October.

A full program of model studies was also carried out by the Hydraulics Section in the Hydraulics Laboratory in Regina. This program included:-

- (1) Determination of sluice discharge co-efficients.
- (2) Determination of weir discharge co-efficients for broad-crested and trapezoidal weirs.
- (3) A detailed study on the problem of energy dissipation for chute spillways. This item alone required about 5 months of testing.

## Drainage Division

The salinity problem experienced on much of the soil in Western Canada is accentuated on lands under irrigation. In addition, surplus water on irrigated land usually results in some areas becoming waterlogged. Experience has shown that without proper drainage on irrigated land, the salt and water content of the soil builds up to a point where it becomes unproductive. To investigate the problems arising on P. F. R. A. irrigation projects, the Drainage Division was organized in 1949.

Through surveys and experimental work, information is provided for the maintenance and reclamation of irrigated land. During the development of irrigation projects, the Drainage Division works closely with the other services on the location of canals, on problems associated with canal seepage and on the location and type of drains for specific soil types.

The activities of the 1956-57 season included investigations, surveys, construction and reclamation work on the Bow River and St. Mary Projects in Alberta, and the Eastend, Maple Creek and Swift Current Irrigation projects in Saskatchewan.

### BOW RIVER PROJECT

#### Farm Use of Water

Since 1954, in co-operation with the Experimental Farms Service studies have been conducted to determine the efficiency of actual farm use of irrigation water in the Vauxhall and Hays Districts of the Bow River Irrigation Project. Low efficiencies in the use of water for irrigation on the project appeared to be due to the average depth of water applications exceeding the soil root zone storage capacity.

#### Ground Water Observations

The reading of piezometers permanently installed in 1951 continued through 1956. The general trend toward lower ground water levels on the project over the first few years did not continue during 1956 but remained stationary throughout the year.

#### Canal and Dugout Linings

Studies of canal and dugout linings were initiated in 1954. Polyethylene film was tested as a dugout lining in 1955 and as a dugout cover in 1956. These studies have shown greater care of installations is necessary for both liner and cover before their true value can be ascertained.

#### Land Levelling

Surveys were completed on 1271 acres on 25 farms in the Vauxhall area. Levelling plans were completed for 28 farms totalling



1394 acres. Construction with crawler tractors and scrapers was completed on 17 farms, totalling 656 acres. The information gained from a study of the utilization of land levelled in the Vauxhall area will be used to improve levelling technique and irrigation practices.

#### Drainage Surveys

Drainage surveys were made on Drain Area #9 and #1 to record the topography, drill and auger holes, ground water observation wells and tentative drain location. Surveys were also made in connection with soil salinity and soil classification. Other miscellaneous surveys were conducted in the Vauxhall and Hays area.

#### Seepage

Measurements were continued on the amount of water loss by seepage in the Vauxhall area. Where seepage is excessive, water logging and alkali patches have appeared. Clay linings of canals have significantly reduced canal seepage.

#### Distributary 'U'

In 1956 an investigation to determine cultural and irrigation methods necessary to bring this area under sustained irrigation and the possibility of using sub-surface irrigation was initiated.

A tile drain with controls and six permanent observation wells were installed to observe fluctuations in water levels in the soil. Surface irrigation using 6-inch syphon tubes proved much more efficient than opening the ditch banks. Tests indicated that with improved water-spreading facilities a stable ground water level could be controlled as desired. Measurements were also taken of the water entering the area and the amount being discharged through the drainage outlet with a view to evaluating and improving irrigation efficiency.

Soil investigations involving chemical and fertility analysis, field infiltration studies, and available moisture studies were extended in 1956.

#### Drainage and Soil Classification

Soil salinity and drainage surveys were completed on a number of farms and recommendations for improving and reclaiming problem areas were suggested. In addition, physical and chemical laboratory tests have been carried out on nine quarters in the Vauxhall area and approximately 60 lots proposed for irrigation in the Hays area.

The Drainage Division also carried out soil investigations on several farms to determine whether land levelling would be advisable. Recommendations were made in accordance with the findings.

A detailed soil classification was made of the proposed irrigation development in the Grantham, Vauxhall and Hays areas.

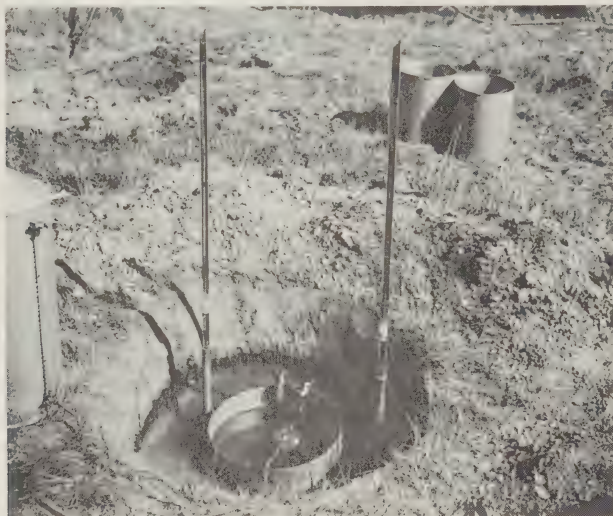
During 1956 extensive investigations were carried out on land classed as non-irrigable because of salinity and high water table. Piezometers were installed to record ground water levels. Following a



complete soil survey, a drainage system was outlined and improvement of the present open drain was suggested. Leaching trials were begun in 1956 but were not sufficiently extensive to obtain any definite results.

#### Special Soil Investigations

Fertility and microbiological surveys carried out in 1956 on levelled land indicated a reduction in the fertility of cut and fill areas. The Drainage Division also made other special soil investigations such as infiltration studies on levelled land, ring and well permeameter methods of determining hydraulic conductivity, and density studies of glacial till.



Gauge installation for field determination of hydraulic conductivity above a water table.

Ref. #12769

#### Irrigation and Drain Water Studies

Routine testing of the quality of irrigation waters begun in 1954 was extended during 1956. The water diverted from the Bow River at Carseland is of very good quality. An increase in salt content is noted in Lake McGregor and Travers Dam storages. The Little Bow River appears to add appreciable salts to the Travers Reservoir.

Drain water samples taken on the Bow River project were analyzed. In general, the salt concentration varies directly with the rate of flow. A considerable amount of salt is removed where drains have been established. Discharge rates from tile drains were measured periodically last year.

## ST. MARY PROJECT

### Soil and Drainage Investigations

Hydraulic conductivity studies were completed in the Cranford area adjacent to the High-Line Canal. A preliminary study was made on selected portions of the older irrigation areas at Coaldale, Rotation 'U' at the Lethbridge Experimental station, Diamond City and Picture Butte. Rotation 'U' containing land which has a record of high production under irrigation for 47 years without drainage, shows a salt concentration somewhat higher than virginal prairie soil but not in the range that affects plant growth. The water table has been from 2 to 4 feet for many years. Some profiles in Rotation 'U' indicate a trend for salt to accumulate in the surface foot of soil which may lower future crop yields. The lack of evidence of salinization in the heavier soils in the areas studied is thought to be due to the low infiltration rate of the surface soil and the small amount of irrigation water applied.

### Taber Area

Ground water reading continued in the Taber area in 1956 showed a downward trend in the water table. There appears to be no indication of a general drainage problem developing in this area. Seepage loss measurements by ponding method were conducted on Laterals M and G. Varying degrees of seepage were observed along both canals.

### Magrath Area

Seepage loss measurements conducted by the Drainage Division on the main canal and a lateral on this project indicated the losses to be sufficiently high to cause extensive land damage. The heavy soil and the shallow rock bed combined with the long period that the water is in the lateral, tends to create this unsatisfactory condition. Changes in irrigation procedure and the establishing of a drainage system on land suitable for drainage were recommended in this area.

## EASTEND IRRIGATION PROJECT

Seepage loss measurements by the ponding method were carried out to test the effectiveness of lateral linings. These indicated a reduction in canal seepage where clay lining had been installed in 1951. Canal seepage has resulted in land along the canal being abandoned because of waterlogging and salinizing.

## MAPLE CREEK IRRIGATION PROJECT

Surveys in this project show a slight increase in canal seepage through clay linings installed in previous years. The performance of

the clay lining continues to be satisfactory. Good grass growth along the canal bank and roadway eliminate canal bank erosion and weed growth.

Drainage by pumping is being developed on the Upper 'V' and Lower 'V' projects. Conclusive results have not yet been obtained.

#### SWIFT CURRENT IRRIGATION PROJECT

Seepage loss measurements on the main canal where it has been lined with asphalt or clay, show a considerable reduction in the amount of water loss through seepage. Shotcrete installed in 1950 in Lateral A is badly cracked even after being repaired.

Soil and drainage surveys to determine the suitability of selected sites for consumptive use of water studies in the Swift Current area by the Experimental Farm were undertaken by the Drainage Division in 1956.

Seepage from the Rush Lake lateral varies considerably. In some sections the adjacent land is becoming waterlogged. Surveys in this area show the heavy lake clay to be virtually undrainable. Tile drains installed in 1955 seem to be reasonably effective in cutting off flows from adjacent higher lands. The tile drain water discharge from the pumping well established on the project, decreased as the season progressed. This drainage water carries a high concentration of salt.

#### Herbert Supply Canal

Seepage from a section of the Herbert Main Supply Canal appears to have been checked with the use of a clay lining which was installed in 1952.

## CONSTRUCTION EQUIPMENT AND SUPPLY DIVISION

As the name of the division indicates, there are a variety of activities included in the division. These activities are generally of a service nature to other divisions of P. F. R. A. and Major Projects. Replacements for the fleet of vehicles, which comprises some 300 cars, trucks jeeps and snowmobiles, are purchased on a tender basis through a central purchasing agent. Vehicles are generally purchased from local dealers in the area where the vehicle will operate and most of the servicing of vehicles is done by local dealers. Records of operating cost are assembled and reported to the records office of the department for processing.

There are over 100 crown-owned residences and about 500 other buildings on community pastures and irrigation projects. Nearly all of these are in rural areas where fire protection is the responsibility of those occupying the buildings. A regular inspection of all buildings is maintained in order to see that adequate fire fighting equipment is serviceable and that the occupants are familiar with the use of the equipment. The inspection includes instruction in fire prevention practices which includes general cleanliness and tidiness of all premises, as well as safety practices.

The operation and maintenance of community pastures, irrigation developments, and community projects is carried out by P. F. R. A. for a period after construction is completed. The general policy is to employ local contractors for maintenance work and much of it is satisfactorily done in this way. Many repair jobs, however, are small and in isolated locations while others are difficult to estimate as they may have unusual construction problems. Maintenance jobs frequently require equipment which is not available from local contractors nor do they have experienced personnel to supervise the work. To supplement local contractors facilities, a number of versatile maintenance crews have been built up to provide this service. They are equipped with adequate machinery, tools, and services which, with the use of local earthmoving machinery, trucks, etc. enable them to do high quality work at reasonable cost and in a manner which has brought favorable public comment.

During the year, these crews undertook over 50 various jobs including improving stockwatering facilities in community pastures, building timber bridges, repairing spillways, constructing a root house at the Outlook predevelopment farm, building two gauging stations for hydrometric measurements and assisting the Department of Public Works with difficult pile driving work on a wharf on Last Mountain Lake. Without this supplemental service, many of these jobs might not have been done or have been done in a less satisfactory manner since they require skills and equipment not locally available and are not large enough to interest contractors who are equipped to undertake them.



To service the necessary equipment, the division maintains repair shops for both heavy equipment and vehicles. The use of these shops enables modification of equipment for special purposes and the manufacture of some peculiar requirements. Facilities at the Moose Jaw depot enable a number of otherwise seasonally employed men to be used through most of the winter months, assisting with equipment repair, construction of camp trailers, building water troughs for community pastures and other work. This helps to make it possible for a relatively small number of men to accomplish a large volume of work during the limited field work season.



Close-up of welder making frame for camp trailer in the P.F.R.A. workshop at Moose Jaw.

Ref. #3288

The problem of supply of materials which are not locally available at the time required, is aided considerably by a revolving stores fund. This fund enables treated timber, which is usually available only on special order, being ordered in advance of requirements and carried forward to the following year if necessary. Some steel items, which are often in short supply and are frequently required for emergency work, can be stocked in limited quantity in the revolving fund stores. The stores section is operated on a minimum stock basis and adequate records kept to prevent unnecessary overstocking or carrying of unnecessary items. Other stores required for general use are carried only as required and material is obtained direct from local sources wherever possible.

The extensive nature of this division's activities requires employment of a variety of skills, trades and abilities. Adequate supervision of all activities is provided by experienced personnel and every effort is made to provide efficient service to the whole organization.

## PLANNING AND INFORMATION DIVISION

First established in 1949, the Planning and Information Division functions as a separate unit within the P. F. R. A., providing planning and information, library and photographic services to all branches and divisions of the Organization.

**Planning and Information:-** The duties of this section are principally the collection and assembling of factual information pertaining to the history and development of P. F. R. A. projects for use as a guide in future planning and in the preparation of reports and other publications required for public distribution. Included in this work is the preparation of progress and summary reports on P. F. R. A. projects; the preparation of the P. F. R. A. Annual Report; and the preparation of annual reports on P. F. R. A. activities used in the Annual Report of the Minister of Agriculture, and the Canada Year Book. In addition, it involves the preparation and editing of material on P. F. R. A. activities used in articles appearing in technical journals, magazines and newspapers; filling requests for information on P. F. R. A. activities from schools, government and private agencies, and research institutions; and carrying out special research assignments as required by the Director or other divisions of P. F. R. A.

The section is also called upon at times to represent P. F. R. A. on special departmental and inter-departmental committees; act as secretary at meetings arranged by P. F. R. A.; and handle arrangements for public events.

A further activity of the section is to be responsible for arranging the program and itinerary of Columbo Plan students and other visitors to P. F. R. A.

**Library:-** The principal responsibilities of the Planning and Information Division Library, are to handle the ordering and distribution of books, periodicals and publications required by P. F. R. A. headquarters and field offices, and to maintain a complete inventory and catalogue for all books, publications and government documents held by P. F. R. A. either in the central library or field offices. The library also provides an inter-library loaning service to all divisions, branches and offices of P. F. R. A. as well as other Federal Department of Agriculture offices in Regina, Indian Head and Swift Current.

**Photography:-** This section provides photographic reproduction services and photographer services to all divisions and branches of P. F. R. A. as well as other Federal Government Departments in Regina and Indian Head; assumes responsibility for the care and maintenance of P. F. R. A. photographic equipment in Regina and field offices; and the cataloguing and filing of P. F. R. A. photographs and negatives.



General view of information and reference library  
at P. F. R. A. headquarters - Regina.

Ref. #13800

In addition to routine duties performed by the Planning and Information Division such as the preparation of the P. F. R. A. Annual Report, special efforts were directed during the year to re-vamping the system of filing and cataloguing photographs in the photographic section, which now contains approximately 15,000 black and white prints and 3,000 color slides. The present system not only greatly expedites the handling of photographic material in the section itself, but serves as a guide on which can be based systems of filing photographs in branch offices. Emphasis in the photographic program during 1956 was also given to establishing more complete ground and air coverage for P. F. R. A. projects completed or currently under development, and conducting searches through old reports and files in branch offices, for early development pictures.



Increased attention during the 1956-57 fiscal year was devoted to the preparation of progress and summary reports on projects currently under investigation, under construction, or completed during the year. The intention is that these reports will be used as a ready reference for information concerning the early history, construction and operation of projects undertaken by P. F. R. A. For this purpose the reports will include in addition to a written section, an appendices containing statistical data pertaining to each project and a bibliography of the more important reports and memoranda written on the subject. To date fifteen reports of this kind have been written covering the larger water development projects.

Over 500 separate requests for information were handled by the Planning and Information Division of P. F. R. A. during 1956. The majority of these requests originated from schools and colleges in the three prairie provinces. Others included requests submitted to P. F. R. A. through Government channels in Ottawa, requests from newspapers and magazine publishing houses, and requests from private individuals.

Following lengthy negotiations, the Planning and Information Library was officially designated as a branch of the central agricultural library in Ottawa in 1956, to function on a regional basis serving all Federal Government services of the Department of Agriculture in and surrounding Regina. A similar attempt is being made to establish closer ties with the Information Division of the Federal Department of Agriculture in Ottawa.

# APPENDIX 1

## Cumulative Statement

### Development and Operation of Community Pastures under the Prairie Farm Rehabilitation Act 1938 to March 31, 1957

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (Acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	X Acres per Livestock unit	Cost of Operation Revenue \$	Operating Costs \$	Net Operating Cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	108,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
						4,529,013.32	4,508,639.90		

X - A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

## APPENDIX II

P. F. R. A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1956-57

- 70 -

Community Pastures and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1956	Accumulated Cost of Construction March 31, 1957	1956-57 Stock Pastured	
				Cattle	Horses
Pasture Units - Saskatchewan					
Coalfields #4, North Portal	31, 940	129, 619.28	144, 501.23	2, 240	64
Estevan - Cambria #5-6, Macoun	6, 720	14, 246.95	17, 216.68	240	--
Masefield #17, Orkney	33, 600	86, 196.81	90, 833.27	1, 604	4
Lone Tree #18, Bracken	32, 960	72, 061.39	86, 954.76	2, 363	24
Battle Creek #20, Divide	66, 880	109, 469.56	112, 267.53	2, 455	17
Nashlyn #21, Consul	61, 520	69, 767.87	77, 963.51	2, 387	--
Govenlock #22, Govenlock	68, 800	94, 250.93	105, 247.04	2, 454	--
Lomond #37, Pasture #1, Goodwater	23, 360	60, 739.60	69, 010.93	2, 123	26
Lomond #37, Pasture #3, Maxim	18, 400	65, 755.14	68, 978.93	1, 784	17
Laurier #38, Lomond #37 - #2, Radville	37, 120	74, 920.62	81, 958.63	3, 037	67
The Gap #39, Hardy	13, 760	43, 001.67	49, 525.28	1, 397	16
Val Marie #47, Val Marie	156, 160	248, 271.87	249, 955.36	7, 319	9
Beaver Valley #47A, Val Marie	11, 360	23, 956.95	25, 445.11	679	--
Reno #51, Pasture #1, Robsart	17, 120	56, 188.94	57, 233.59	1, 154	12
Reno #51, Pasture #2, Consul	11, 360	28, 197.48	28, 197.48	1, 062	--
Tecumseh #65, Forget	18, 560	60, 599.00	64, 490.77	2, 208	31
Brokenshell #68, Pasture #1, Yellow Grass	22, 720	45, 814.59	57, 652.77	1, 683	49
Brokenshell #68, Pasture #2, Weyburn	8, 160	13, 583.47	14, 818.47	707	--
Excel - Key West #71-70, Ormiston	30, 400	70, 038.16	76, 038.07	3, 035	--
Auvergne - Wise Creek #76-77, Ponteix	42, 880	112, 613.89	137, 158.25	3, 081	12
Wellington #97, Tyvan	25, 680	94, 512.13	98, 669.45	3, 577	34
Caledonia - Elmsthorpe #99-100, Milestone	24, 800	103, 524.12	106, 048.21	2, 075	47
Shamrock #134, Shamrock	26, 080	75, 099.93	77, 574.39	2, 097	27
Swift Current - Webb #137-8, Beverly	18, 720	76, 214.77	77, 929.61	1, 569	5
Gull Lake #139, Tompkins	10, 720	30, 189.71	30, 650.46	542	--
Big Stick #141, Maple Creek	18, 160	40, 929.03	43, 339.75	1, 260	12
Bitter Lake #142, Maple Creek	47, 410	109, 504.42	111, 104.36	2, 634	--
Spy Hill #152, Welby (operated in conjunction with Ellice, Manitoba)	20, 000	50, 399.64	51, 315.25	2, 280	23
Elbow #223-4, Elbow	29, 440	74, 779.63	77, 615.14	2, 440	43
Beaver Hills #245-6, Homefield P.O.	44, 160	105, 322.02	111, 291.30	2, 511	117
Willner #253, Rosemae P.O.	12, 800	50, 694.58	51, 450.24	1, 676	20

Community Pasture and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1956	Accumulated Cost of Construction March 31, 1957	1956-57 Stock Pastured	
				Cattle	Horses
Pasture Units - Saskatchewan - Cont'd.					
Coteau #255, Birsay	27, 520	57, 272.63	62, 818.09	1, 619	14
Monet #257, Elrose	46, 520	105, 135.47	111, 055.85	3, 070	21
Fairview #258, Rosetown (under construction)	17, 000	34, 404.28	82, 799.27		
Newcombe #260, Glidden	53, 120	158, 035.41	162, 059.35	3, 488	22
Mantario #262, Empress, Alta.	24, 960	67, 323.68	69, 706.80	1, 440	--
Wreford #280, Hatfield	13, 440	77, 518.61	78, 916.96	1, 424	--
McCraney #282, Davidson	10, 720	66, 934.07	68, 725.24	1, 778	--
Rudy-Rosedale #284-3, Broderick	19, 040	83, 975.55	87, 109.35	2, 049	44
Hillsburgh #289, Brock	13, 600	52, 235.09	53, 826.64	809	--
Eagle Lake #289-319, Netherhill	22, 500	60, 096.92	81, 258.44	918	12
Kindersley - Elma #290-1, Smiley	21, 400	110, 303.62	112, 274.62	1, 978	59
Usborne #310, Venn	12, 720	36, 570.38	37, 070.38	1, 431	--
Dundurn #314, Dundurn	44, 960	110, 144.16	110, 899.54	1, 934	--
Montrose #315, Donavon	20, 480	54, 110.60	63, 329.25	1, 235	--
Oakdale #320, Beaufield	20, 800	60, 346.58	60, 411.74	942	10
Antelope Park #322, Hoosier	34, 500	100, 572.97	102, 107.61	2, 580	54
Wolverine #340, Plunkett	17, 280	64, 552.43	67, 756.85	1, 863	35
Mariposa #350, Kerrobert	27, 020	84, 091.97	88, 027.34	2, 044	45
Progress #351, Kerrobert	19, 680	59, 021.39	64, 234.48	1, 637	--
Heart's Hill #352, Compeer, Alta.	15, 160	28, 105.07	36, 272.47	1, 617	1
Park #375, Langham	7, 040	22, 535.62	22, 535.62	411	--
Battle River - Cutknife #438-9, Gallivan	30, 720	80, 098.56	81, 983.45	1, 570	25
Royal #465, Lorenzo	65, 220	165, 796.66	187, 302.82	1, 760	17
Paynton #470, Paynton	23, 040	70, 337.11	70, 917.07	1, 381	25
Totals for Saskatchewan		4, 099, 982.98	4, 415, 835.05	104, 651	1, 060

Special Project - Bitter Lake Irrigation included in Bitter Lake Pasture



Community Pastures and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1956	Accumulated Cost of Construction March 31, 1957	1956-57 Stock Pastured	
				Cattle	Horses
Pasture Units - Manitoba					
Ellice Pasture, Welby, Sask. (operated in junction with Spy Hill #152)	20, 320	28, 746.37	28, 746.37		
Archie Pasture, Welwyn, Sask.	40, 340			885	6
Portage Pasture, Poplar Point	14, 640	88, 295.35	89, 249.36	2, 485	69
Woodlands Pasture, Poplar Point	20, 960	43, 385.21	44, 793.85	2, 454	31
Lakeview Pasture, Langruth	29, 280	67, 942.95	68, 220.56	2, 524	5
Westbourne Pasture, Gladstone	11, 520	80, 482.71	80, 530.71	1, 299	2
Langford Pasture, Neepawa	19, 040	39, 156.69	40, 151.47	1, 951	19
Wallace Pasture, Elkhorn	3, 280	61, 676.33	65, 336.10		
		(Operated by R.M. Wallace)			
Totals for Manitoba	159, 380	409, 685.61	417, 028.42	11, 598	132
GRAND TOTALS	1, 759, 570	4, 509, 668.59	4, 832, 863.47	116, 249	1, 192

# APPENDIX III

## PRAIRIE FARM REHABILITATION ACT

Showing number of projects and amount of financial assistance paid since the inauguration of program to  
March 31, 1957

Province & Classification	DUGOUTS		STOCKWATERING DAMS		IRRIGATION SCHEMES		TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
<b>MANITOBA</b>								
Individual	10,503	1,037,824.20	309	22,809.21	124	37,479.51	10,936	1,098,112.92
Neighbor & Community	47	9,282.04	26	20,449.43	7	2,053.00	80	31,784.47
Total	10,550	1,047,106.24	335	43,258.64	131	39,532.51	11,016	1,129,897.39
<b>SASKATCHEWAN</b>								
Individual	28,401	3,157,578.74	4,088	350,344.47	2,046	468,770.85	34,535	3,976,694.06
Neighbor & Community	434	181,190.38	142	99,113.19	82	34,149.37	658	314,452.94
Total	28,835	3,338,769.12	4,230	449,457.66	2,128	502,920.22	35,193	4,291,147.00
<b>ALBERTA</b>								
Individual	4,212	439,638.45	2,110	199,324.81	950	224,348.07	7,272	863,311.33
Neighbor & Community	36	12,022.64	43	27,337.61	19	13,178.07	98	52,538.32
Total	4,248	451,661.09	2,153	226,662.42	969	237,526.14	7,370	915,849.65
<b>GRAND TOTAL</b>	43,633	4,837,536.45	6,718	719,378.72	3,228	779,978.87	53,579	6,336,894.04

# APPENDIX IV

Progress by Years in the Construction of Small Projects P. F. R. A. Water Development Program  
1935 to March 31, 1957.

Number of Projects Constructed					Financial Assistance Paid on Projects				
Fiscal Year	(1) DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL	
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08	
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31	
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00	
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59	
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17	
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31	
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84	
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00	
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04	
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51	
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97	
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74	
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34	
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14	
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79	
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84	
1951-52	473	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08	
1952-53	861	119	288	1,268	100,219.54	13,382.92	92,397.46	205,999.92	
1953-54	1,774	178	181	2,133	204,148.93	18,373.83	46,550.99	289,073.75	
1954-55	1,300	234	180	1,714	149,184.48	24,751.11	44,473.20	218,408.79	
1955-56	493	145	104	742	56,733.44	15,028.46	23,236.94	94,998.84	
1956-57	868	143	107	1,118	96,094.18	14,957.18	25,995.63	137,046.99	
TOTAL	43,633	6,718	3,228	53,579	4,837,536.45	719,378.72	779,978.87	6,336,894.04	

(1) DO - Dugout      SWD - Stock Watering Dam      IRR - Individual Irrigation Project

# APPENDIX V

## WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS To March 31, 1957.

### MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	-	-	\$ 5,250.00
Birtle Dam	Birtle	Stockwatering	1947	-	-	11,490.00
Boissevain	Boissevain	Storage	1954	-	580	29,992.00
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	-	27,107.00
Brandon Water Supply	Brandon	Storage	1940	-	500	3,996.00
Clearwater Storage	Clearwater	Stockwatering	1938	-	12	5,949.00
Crystal City Storage	Crystal City	Stockwatering	1935	-	3	3,334.00
Dead Horse Creek Dam	Morden	Irr. & Stockwatering	1941	100	1,200	344,274.00
Dead Lake Community	Gladstone	Irr. & Stockwatering	1950	20	90	1,933.00
Deloraine	Deloraine	Stockwatering	1953	-	1.5	770.00
Edwards, R. M. of	Melita	Stockwatering	1935	-	100	10,214.00
Hogue Dam	Sanford	Stockwatering	1953	-	-	29,183.00
Hampson Dam	Sanford	Storage	1954	-	420	16,899.00
Hartney	Hartney	Irr. & Dam	1941	-	-	10,264.00
Killarney	Killarney	Multi-purpose Reservoir	1956	-	800	41,965.00
LaSalle River Dams	LaSalle	Stockwatering	1941	-	900	22,989.00
Lewko Dam	Sanford	Storage	1954	-	320	20,874.00
Little Souris River Dam	Melita	Stockwatering	1945	-	250	1,380.00
McAuley Community Dam	McAuley	Stockwatering	1955	-	20	2,051.00
Melita	Melita	Irr. & Dam	1941	3,900	3,200	11,372.00
Minnedosa Dam	Minnedosa	Storage	1950	20	1,500	105,951.00
Morris River - Rock Lake	Carman	Stockwatering	1940	-	10,000	23,401.00
Napinka	Napinka	Irr. & Dam	1941	-	-	6,770.00
Oak Lake	Oak Lake	Irrigation	1956	13,000	-	119,205.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Park Lake	Neepawa	Stockwatering	1953	-	-	\$ 21,625.00
Plum Coulee	Plum Coulee	Multi-Purpose Res.	Incomplete	-	12	4,352.00
Rosebank Dam	Rosebank	Stockwatering	1948	-	32	12,161.00
Rosseau River Dam	Dominion City	Multi-purpose Res.	Incomplete	-	-	46,546.00
Shoal Lake Project	Shoal Lake	Stockwatering	1948	-	3,500	8,491.00
Souris, Town of	Souris	Stockwatering	1935	-	150	76,837.00
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	-	5	1,470.00
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968.00
Waskada	Waskada	Stockwatering	1953	-	1.5	853.00
Wawanesa	Wawanesa	Irr. & Dam	1941	-	-	125,332.00
Westbourne, R.M. Of	Gladstone	Stockwatering	1947	-	-	5,993.00
Whitemud River	Woodside	Stockwatering	1949	-	160	6,506.00
Whitemud River Storage	Gladstone	Stockwatering	1943	-	660	11,464.00
SASKATCHEWAN						
Aberdeen, R.M. of	Aberdeen	Dugout	1955	-	1.5	916.00
Adair Creek	Wolseley	Multi-purpose Dam	1956	40	350	59,849.00
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Airdale	Senlac	Dugout	1955	-	1.5	859.00
Allan	Allan	Stockwatering	1948	-	300	4,477.00
Alpine	Senlac	Dugout	1956	-	1.5	877.00
Alticane	Richard	Stockwatering	1951	-	2.5	858.00
Arcola	Arcola	Stockwatering	1939	-	(underground)	17,310.00
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000.00
Avon Heights Grazing Co-op.	Shanavon	Stockwatering	1955	-	60	2,428.00
Avonhurst	Qu'Appelle	Stockwatering	1956	-	1.5	3,200.00
Balldon and Tilney	Balldon	Stockwatering	1950	-	4.	780.00
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203.00
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294.00
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739.00
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Beadle	Beadle	Stockwatering	1949	-	2	\$ 997.00
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998.00
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746.00
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Big Arm Storage	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520.00
Boharm	Boharm	Stockwatering	1948	-	100	6,250.00
Boharm Community Dugout	Boharm	Multi-purpose Res.	1956	-	1.5	998.00
Bracken	Bracken	Stockwatering	1946	-	158	1,001.00
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
Bright Water Creek	Hanley	Irrigation	1956	2,500	3,500	11,713.00
Brock Community	Brock	Stockwatering	1949	-	2	951.00
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723.00
Cabri	Cabri	Stockwatering	1948	-	340	37,553.00
Cactus Lake	Cactus Lake	Stockwatering	1949	-	2	730.00
Cadillac	Cadillac	Irrigation & Dam	1945	800	1,350	32,887.00
Camberley	Camberley	Irrigation & Dam	1950	-	100	2,106.00
Canora	Canora	Storage	1941	-	300	16,128.00
Carleton, Hamlet of	Carleton	Dugout	1955	-	1.5	998.00
Caron	Caron	Storage	1948	-	100	17,109.00
Caron Community (Dam)Centre Caron	Caron	Stockwatering	1949	-	4	697.00
Caron Water Development	Thunder Creek	Storage & Dam	1944	-	43,500	710,433.00
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999.00
Ceylon Reservoir	Ceylon	Irrigation & Dam	Incomplete	300	250	6,396.00
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208.00
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999.00
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000.00
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807.00
Consul - Vidora	Vidora	Irrigation & Dam	1950	3,000	-	62,500.00
Crane Valley	Viceroy	Irrigation	1950	-	2	599.00
Craven Dam	Qu'Appelle Valley	Stockwatering	1943	x	-	33,675.00
Crooked & Round Lake	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	48,650.00
Cut Knife	Cut Knife	Stockwatering	1950	-	5	280.00
Cypress Storage	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000.00
Davidson	Davidson	Irrigation & Dam	1937	100	277	3,114.00
Davin	Kronau	Stockwatering	1947	-	1,080	13,501.00
Dead Lake	Macoun	Irrigation & Dam	1941	Souris River Development		17,528.00
Delisle	Delisle	Stockwatering	1950	-	45	4,899.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs \$
Denzil	Macklin	Stockwatering	1951	-	2	975.00
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,438.00
Dry Lake	Forward	Stockwatering	1949	-	600	9,729.00
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996.00
Dunning	Radville	Irrigation	1951	120	200	3,566.00
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742.00
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432.00
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998.00
East Borden	Borden	Stockwatering	1950	-	60	526.00
East Manitou	Nielburg	Dugout	1953	-	1.5	789.00
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Eastview	Eastview	Stockwatering	1949	-	200	5,970.00
Eatonia	Etonia	Stockwatering	1949	-	12	1,199.00
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	-	41,753.00
Fgg Lake	Avonhurst	Multi-purpose Reservoir	Incomplete	800	-	3,925.00
Elfros	Elfros	Stockwatering	1949	-	25	7,330.00
Elrose	Elrose	Stockwatering	1950	-	5	999.00
Eston	Eston	Stockwatering	1954	-	10	11,469.00
Fahman's Creek Project	Balgonie	Stockwatering	1949	-	400	15,599.00
Fairhill	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	4,302.00
Fielding	Maymont	Stockwatering	1950	-	50	918.00
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596.00
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348.00
Fillmore Reclamation Project	Fillmore	Irrigation	Incomplete	1,600	-	656.00
Fleming	Moosomin	Stockwatering	1950	-	75	3,282.00
Foam Lake	Foam Lake	Irrigation	Incomplete	4,000	-	10,161.00
Francis Lake	Morse	Irrigation	Incomplete	1,560	-	17,305.00
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096.00
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177.00
Girvin	Girvin	Stockwatering	1937	-	19	2,180.00
Glasvein	Glasvein	Dugout	1953	-	1.5	554.00
Glenside	Glenside	Stockwatering	1948	-	150	3,286.00
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783.00
Gordon Grazing	Chauvin	Dugout	1953	-	1.5	830.00
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186.00
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Hague Dugout	Hague	Stockwatering	1950	-	2	\$ 1,000.00
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748.00
Hanley	Hanley	Stockwatering	1946	-	60	3,797.00
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074.00
Hugonard Coulee Dam	Lebret	Multi-purpose Reservoir	1956	100	400	64,231.00
Jackfish Creek	Meota	Stockwatering	1943	-	90	2,940.00
Jubilee	Indian Head	Multi-purpose Reservoir	1956	-	1.5	979.00
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092.00
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946.00
Kaposvar Creek	Melville	Stockwatering	1954	-	1,400	102,747.00
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927.00
Kerrobot	Kerrobot	Multi-purpose Reservoir	Incomplete	-	40	1,434.00
Kincald	Kincald	Stockwatering	1956	-	10	13,395.00
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007.00
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
Koch - Froh	Qu'Appelle	Multi-purpose Reservoir	1956	160	-	2,390.00
Lac Pelletier	Lac Pelletier	Stockwatering	1937	-	3,350	2,139.00
Lacadena	Lacadena	Irrigation	1954	-	-	9,678.00
Laird, R. M. of	Waldheim	Dugout	1953	-	1.5	999.00
Lafleche	Lafleche	Stockwatering	1940	-	38	2,524.00
Lafleche Dam	Lafleche	Irrigation	Incomplete	15,000	30,120	415,082.00
Lajord	Lajord	Flood Control	1936	-	300	13,800.00
Lake of the Rivers	Assiniboia	Stockwatering	1938	-	300	10,805.00
Lancer Water Users	Lancer	Irrigation	1953	1,265	-	35,000.00
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752.00
Langenburg	Langenburg	Irrigation	Incomplete	-	2.5	3,000.00
Last Mountain Lake	Qu'Appelle Valley	Irrigation & Water Control	1941	x	-	42,721.00
Lebret	Qu'Appelle Valley	Irrigation & Water Control	1941	x	-	16,307.00
Leroy, R. M. of	Leroy	Stockwatering	1956	-	1.5	994.00
Linacre Grazing Co-op.	Fox Valley	Dugout	1955	-	1.5	644.00
Lodge Lake	Evesham	Dugout	1955	-	1.5	939.00
Little Manitou Lake	Senlac	Dugout	1953	-	1.5	862.00
Lonesome Lake	Watrous	Diverson Canal	Incomplete	-	-	20,182.00
Long Creek #1	Vidora	Irrigation	1949	900	800	2,771.00
Long Creek #2	Estevan	Stockwatering	1938	-	137	8,729.00
Loon Creek	Estevan	Stockwatering	1938	-	90	8,701.00
Loon Creek	Markinch	Stockwatering	1945	-	700	7,180.00
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Meadowland	Macclin	Irrigation	1954	500	-	\$ 6,370.00
Manitou Cattle Breeders Co-op. Chauvin	Macclin	Dugout	1955	-	1.5	935.00
Macclin Storage	Macclin	Stockwatering	Incomplete	-	40	967.00
Mankota Dam	Mankota	Stockwatering	1950	-	10	950.00
Masefield Water Users	Masefield	Stockwatering	Incomplete	500	250	809.00
Montague Lake	Assiniboia	Irrigation	Incomplete	235	-	1,000.00
Maple Creek	Maple Creek	Irrigation & Dam	1938	10,000	23,260	356,179.00
March Flood Irrigation	Cedoux	Irrigation & Dam	1948	400	-	1,765.00
Matador	Matador	Irrigation & Dam	1946	120	220	5,216.00
Masefield	Masefield	Stockwatering	1938	-	40	3,187.00
Maxim Lake	Maxim	Stockwatering	1949	-	5,000	20,472.00
McCraney, R.M. of	Kenaston	Stockwatering	1937	-	350	1,896.00
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992.00
Machtosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990.00
Meeting Lake	Redfield	Stockwatering	1949	-	100	2,683.00
Melaval	Melaval	Stockwatering	1950	-	18	1,200.00
Mennon	Waldheim	Stockwatering	1949	-	2	976.00
Meota, R.M. of	Meota	Dugout	1953	-	1.5	1,000.00
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663.00
Mine Coulee	Neptune	Stockwatering	1948	-	40	4,377.00
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Irrigation	1937	-	8,000	14,829.00
Moosomin Dam	Moosomin	Storage	1954	-	9,000	390,670.00
Monet	Hughton	Stockwatering	1949	-	10	878.00
Mosbank	Mosbank	Stockwatering	1949	-	2	875.00
Muenster	Muenster	Irrigation	1949	25	11	2,754.00
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477.00
North Battleford, City of	North Battleford	Dugout	1953	-	1.5	970.00
North End Grazing	Macclin	Dugout	1954	-	1.5	728.00
North Herbert Extension	Herbert	Irrigation	Incomplete	-	-	511,909.00
North Qu'Appelle	Fort Qu'Appelle	Stockwatering	1948	-	100	2,386.00
Oxbow	Oxbow	Irrigation & Dam	1941	3,900	3,200	17,436.00
Pasqua	Moose Jaw	Stockwatering	1948	-	40	3,777.00
Pleasant Creek	Lemberg	Storage	1954	-	500	114,464.00
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360.00
Pipestone Lake	Broadview	Stockwatering	1938	-	1,600	11,785.00
Plenty, Village of	Plenty	Dugout	1955	-	1.5	893.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Poplar River	Coronach	Irrigation & Dam	1950	300	900	\$14, 838.00
Prairiedale	Superb	Stockwatering	1949	-	2	987.00
Prospect Grazing Co-op.	Linacre	Stockwatering	1956	-	1.5	820.00
Radville	Radville	Stockwatering	1947	-	32	5, 019.00
Readlyn	Readlyn	Stockwatering	1950	-	3	800.00
Reciprocity	Glen Bain	Irrigation & Dam	1949	2, 000	1, 750	27, 410.00
Reford	Wilkie	Stockwatering	1951	-	160	1, 814.00
Reward	Reward	Stockwatering	1951	-	-	921.00
Richman Irrigation	Glen Bain	Irrigation	1949	-	1, 000	4, 607.00
Richardson - McKinnon	Consul	Irrigation	1946	3, 000	-	53, 913.00
Rock Glen Grazing	Rock Glen	Irrigation & Dam	1955	600	300	13, 455.00
Rosedale	Hanley	Irrigation	1948	60	100	1, 016.00
Rosemount Co-op.	Landis	Dugout	1953	-	1.5	903.00
Round Hill Water Users	North Battleford	Irrigation & Dam	1950	425	50	4, 791.00
Rough Bark Creek	Goodwater	Stockwatering	1937	-	1, 500	9, 314.00
Russell Creek	Pambrun	Irrigation	1951	1, 000	2, 000	66, 493.00
Salvador	Reward	Stockwatering	1951	-	5	1, 000.00
Saskatoon	Saskatoon	Storage	1940	-	1, 200	290, 446.00
Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29, 115.00
Scotsguard	Scotsguard	Irrigation & Dam	1949	2, 000	3, 000	1, 962.00
Shaheen	Rush Lake	Storage & Irrigation	1949	-	300	9, 028.00
Sherwood	Regina	Dugout	1948	20	3	697.00
Shrimp Lake	Herschel	Stockwatering	1947	-	450	9, 367.00
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	-	75	8, 605.00
Smiley, Village of	Smiley	Dugout	1949	-	1.5	1, 000.00
Smiley	Smiley	Irrigation & Dam	1951	600	300	9, 998.00
Snake Bite	Beechy	Irrigation	1954	665	-	9, 999.00
Snipe Lake	Eston	Stockwatering	1949	-	-	3, 415.00
Snowdown	Fox Valley	Dugout	1954	-	1.5	898.00
Souris - Estevan	Estevan	Irrigation & Dam	1941	-	-	91, 133.00
Souris River	Weyburn	Flood Control	1948	-	-	11, 998.00
South Abernethy Project	Abernethy	Irrigation	Incomplete	320	-	14, 568.00
Southey, Village of	Southey	Multi-purpose Reservoir	1956	-	2	9, 997.00
Stelcam Community Dam	Stelcam	Stockwatering	Incomplete	-	360	9, 791.00
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8, 716.00
Spangler Project	Govenlock	Irrigation	1948	1, 500	2, 100	4, 950.00
Summerberry	Summerberry	Multi-purpose Res.	Incomplete	427	-	6, 824.00
Summercove	Mankota	Irrigation & Dam	1949	1, 200	1, 500	23, 837.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Sunbeam Creek	Indian Head	Multi-purpose Res.	Incomplete	100	300	\$ 3,937.00
Sunny South	Indian Head	Multi-purpose Res.	1956	-	1.5	990.00
Stewart Valley Dugout	Stewart Valley	Stockwatering	1950	-	3	799.00
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961.00
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227.00
Swan Hill Grazing Co-op.	Donavon	Dugout	1955	-	1.5	709.00
Swanson Co-op. Pasture	Donavon	Stockwatering	1956	-	1.5	770.00
Swift Current	Swift Current	Irrigation & Dam	1946	30,000	95,000	816,472.00
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483.00
Tantallon	Tantallon	Stockwatering	1942	-	-	2,790.00
Tatague Lake	Weyburn	Flood Irrigation	Incomplete	10,000	-	9,966.00
Terrell, R.M. of	Spring Valley	Stockwatering	1952	-	10	2,491.00
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204.00
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007.00
Tribune Dam	Tribune	Stockwatering	1950	-	300	6,499.00
Truax	Truax	Stockwatering	1949	-	250	11,899.00
Twelve Mile Lake	Maxstone	Flood Irrigation	1956	-	-	7,998.00
Tyvan	Tyvan	Stockwatering	1947	-	1,000	11,986.00
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West	Val Marie	Irrigation	1940	4,230	2,000	150,639.00
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133.00
Vera Grazing	Vera	Dugout	1953	-	1.5	891.00
Vera Winter Grazing	Vera	Dugout	1954	-	1.5	939.00
Viceroy	Viceroy	Stockwatering	1950	-	3	798.00
West Poplar #1	Killdeer	Irrigation	Incomplete	750	1,000	4,460.00
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905.00
Weyburn	Weyburn	Flood Irrigation	1940	-	4,000	51,311.00
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452.00
Wilson Lake	Lizard Lake	Multi-purpose Res.	Incomplete	400	-	2,813.00
Wittrock	Frenchville	Irrigation	1947	520	-	3,884.00
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800.00
Wolverine Creek	Humboldt	Stockwatering	1945	-	522	52,600.00
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337.00
Woodrow - Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
Wood River Development	Coderre and	Stockwatering	1942	-	4,923	33,738.00
Wynn Community Project	Gravelbourg	Multi-purpose Res.	Incomplete	500	-	2,276.00
Wynyard	Wolseley	Stockwatering	1947	-	35	6,225.00
	Wynyard					



Youker Grazing Co-op.  
Young

\$ 807.00  
8,892.00

(x) - Ultimate irrigation development for all projects along  
Qu'Appelle River Valley 30,000 - (total storage capacity -  
95,600 acre feet).

# ALBERTA

Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252.00
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000.00
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004.00
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
Anatole	Hanna	Stockwatering	1953	-	7	2,990.00
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912.00
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300.00
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990.00
Balzac	Balzac	Irrigation	1956	900	-	8,141.00
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600.00
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029.00
Bartman Dam	Cessford	Irrigation & Dam	1943	1,000	3,000	49,100.00
Beaver Creek Stock Assoc.	Fort MacLeod	Dugout	1955	-	-	981.00
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,995.00
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493.00
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884.00
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500.00
Bowell	Bowell	Dugout	1954	-	1.5	1,000.00
Bowell West Grazing Assoc.	Bowell	Dugout	1955	-	1.5	744.00
Bow Island 40 Mile Grazing	Bow Island	Dugout	1954	-	1.5	782.00
Bownanton	Bowmanton	Stockwatering	1953	-	500	14,860.00
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631.00
B. T. Grazing Co-op.	Hilda	Stockwatering	1956	-	1.5	1,000.00
Bull Pound Creek	Hanna	Stockwatering	1939	-	2,000	-
Bullshead Creek	Medicine Hat	Irrigation & Dam	1940	800	1,130	8,170.00
Cameron	Youngstown	Multi-purpose Dam	Incomplete	662	1,000	2,235.00
# Canada Land & Irrig. Project	Medicine Hat	Irrigation	1936	45,000	-	80,000.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
C. Y. Water Users	Taber	Stockwatering	1949	-	310	\$16,477.00
Champion	Champion	Irrigation	1954	2,500	-	4,984.00
Clear Lake	High River	Stockwatering	1948	-	10,000	35,000.00
Collins	Sheerness	Stockwatering Reservoir	1956	-	40	3,495.00
Commodore	Vulcan	Irrigation	1954	400	-	3,990.00
Comrey Grazing	Comrey	Dugout	1953	-	1.5	1,000.00
Comrey #2	Comrey	Dugout	1954	-	1.5	980.00
Conrich	West Calgary	Irrigation	1954	1,600	-	6,240.00
Consort	Hanna	Stockwatering	1955	-	20	9,651.00
Cowley Community	Cowley	Irrigation	1952	750	-	4,666.00
Cressday	Medicine Hat	Stockwatering	1954	-	-	13,541.00
Cutbank Coulee	Cressday	Stockwatering Reservoir	Incomplete	350	500	2,337.00
Dead Fish Creek	Cessford	Irrigation	1949	4,000	5,000	47,832.00
Del Bonita	Twin River	Stockwatering	1955	-	250	9,196.00
Delia	Morrin	Stockwatering	Incomplete	-	165	3,914.00
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4,368.00
East Berry Creek	Roselynn	Irrigation	1949	1,500	750	9,677.00
Eastern Irrigation District	Brooks	Irrigation	1937	2,280	22,000	22,490.00
Esler	Hanna	Stockwatering	1954	-	17	2,808.00
Esther Flood Irrigation	Macklin	Irrigation	1952	4,000	5,000	4,592.00
Eureka Irrigation Project	Grassy Lake	Irrigation	1949	12,000	1,000	38,568.00
Fertility Grazing Assoc.	Hanna	Stockwatering	1956	-	1.5	998.00
Fish Lake	Pincher Creek	Irrigation & Dam	1954	1,000	-	6,895.00
Franklin Coulee	Retlaw	Stockwatering	1948	-	1,500	20,125.00
Garden Plains	Hanna	Stockwatering	1956	-	1.5	999.00
Graham Creek	Calgary	Stockwatering	1943	-	230	8,529.00
Grainger	Three Hills	Multi-purpose Reservoir	1956	30	117	9,482.00
Greasewood Coulee	Manyberries	Irrigation & Dam	1954	500	650	9,798.00
Hanna	Hanna	Stockwatering	1948	-	500	29,498.00
Hilda Community Project	Hilda	Multi-purpose Res.	Incomplete	-	10	5,035.00
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000.00
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795.00
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843.00
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799.00
Jaydot	Elkwater	Multi-purpose Res.	1956	300	400	8,988.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acres Feet	Costs
Kathryn	Calgary	Irrigation & Dam	1954	300	-	\$ 9,184.00
Lake Beauvais	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
# Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578.00
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345.00
Loveland	Hanna	Irrigation	1954	3,000	-	17,655.00
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993.00
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689.00
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917.00
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473.00
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600.00
# Magrath	Magrath	Irrigation	1939	4,000	-	2,756.00
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	-	5,630.00
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644.00
Morley	Morley	Stockwatering	1956	-	1.5	980.00
Mountain View	Mountain View	Storage	1936	-	4,200	3,000.00
Naismith	Youngstown	Multi-purpose Reservoir	1956	300	145	9,421.00
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000.00
Nester	Pollockville	Multi-purpose Reservoir	Incomplete	300	1,350	1,480.00
Nobleford Water Users	Nobleford	2 dugouts	1953	-	3	11,173.00
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943.00
Pancost - Olson Water Users	Bowell	Dugout	1955	-	1.5	999.00
Parfles	Chancellor	Irrigation	1954	250	-	4,730.00
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782.00
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993.00
Petiski Grazing Assoc.	Nanton	Stockwatering	1955	-	1.5	990.00
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project		
Priddis	High River	Stockwatering	1955	-	312	8,802.00
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	4,812.00
Ranchville Community Res.	Ranchville	Irrigation	Incomplete	300	-	3,137.00
# Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
Rock Lake Project	Brooks	Storage	Incomplete	11,000	-	46,516.00
# Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839.00
Rosegen Water Users	Schuler	Multi-purpose Dam	Incomplete	200	150	1,513.00
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Ross Lake Community Rough Meadow Reservoir Ruks	Raymond Coronation Pincher Creek	Stockwatering Irrigation Irrigation & Dam	1950 Incomplete 1954	- 200 900	300 - 250	\$ 7,987.00 2,471.00 6,484.00
Schuler Water Users Serviceberry Creek Seven Persons Severn Creek Sheerness Grazing (Blois) Sheerness #2 Snake Creek Spondin Starland, M. D. of Stehr Coulee Sounding Creek South Macleod Squaw Coulee	Schuler near Drumheller Seven Persons Rosebud Roselynn Roselynn Calgary Hanna Morrin Walsh Cereal Macleod High River	Multi-purpose Res. Irrigation Stockwatering Irrigation & Dam Stockwatering Stockwatering Irrigation & Dam Dugout Stockwatering Multi-purpose Res. Irrigation Irrigation Irrigation Irrigation	Incomplete 1949 1943 1950 1953 1954 1950 1955 Incomplete 1956 1949 1948 1949	1,500 1,200 - 1,000 - 500 - - - - 8,000 6,000 2,000	5 500 800 1,000 12 50 300 1.5 45 26 5,600 - 455	4,385.00 17,518.00 12,103.00 24,990.00 3,797.00 2,190.00 15,976.00 1,000.00 3,196.00 4,570.00 51,988.00 82,614.00 17,999.00
Three Hills Twin Lakes Twin River Grazing	Three Hills Chancellor Twin River	Stockwatering Irrigation Stockwatering	1948 1954 1953	- 500 -	120 - 125	19,652.00 12,498.00 4,486.00
Vulcan Dam Vauxhall	Vulcan Vauxhall	Irrigation Stockwatering	1951 1948	400 -	150 30	3,997.00 5,883.00
Walsh Flats Wheatacre Dam Wild Horse Storage Wheatacre #2 Wintering Hills Wisdom Water Users Woolford Community Project	Walsh Rockyford Cressday Rockyford Hussar Wisdom Cardston	Irrigation Irrigation Irrigation Irrigation Irrigation Multi-purpose Dam Irrigation	1953 1950 1936 1952 1950 Incomplete 1955	2,100 1,600 3,600 - 1,000 420 400	25,000 1,500 4,500 - 500 500 -	4,700.00 12,976.00 24,370.00 4,744.00 9,993.00 10,808.00 3,593.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592.00

# - P. F. R. A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

# APPENDIX VI

## MAJOR PROJECTS - IRRIGATION RECLAMATION

(Projects by Special Votes of Parliament, Administered by P.F.R.A.)

to March 31, 1957

<u>Name of Project</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. Cap. Acre Feet</u>	<u>Costs</u>
<u>MANITOBA</u>						
Assiniboine River Diking & Cut off	Brandon	River Control	Incomplete	-	-	\$ 712,588.00
North-West Escarpment Reclamation Proj. - Riding						
Mtn. Area	Dauphin	Watershed Control	Incomplete	-	-	787,826.00
Saskatchewan River Reclam- ation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	1,737,158.00
<u>ALBERTA</u>						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						2,353,182.00
(b) Development & Construction						18,409,002.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	11,808,811.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901.00
<u>BRITISH COLUMBIA</u>						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00

(Above includes ONLY Construction Costs)



## APPENDIX VII

## PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

April 1, 1935 - March 31, 1957

		1935 - 1956	1956 - 1957	Total
<b>ADMINISTRATION</b>				
Ottawa Administration	(a)	274,453	31,261	305,714
Regina Administration	(b)	1,195,232	139,860	1,335,092
Total		<u>1,469,685</u>	<u>171,121</u>	<u>1,640,806</u>
<b>EQUIPMENT</b>				
Purchase of Equipment	(k)	1,121,798	168,958	1,290,756
Upkeep of Equipment	(k)	747,240	132,874	880,114
Equipment Depot		1,604,943	299,565	1,904,508
Total		<u>3,473,981</u>	<u>601,397</u>	<u>4,075,378</u>
<b>LAND UTILIZATION</b>				
Supervision		592,712	44,415	637,127
Construction of Community Pastures	(a)	6,140,063	565,147	6,705,210
Pasture Improvements		175,881	180,262	356,143
Operation of Community Pastures		3,821,257	551,559	4,372,816
Purchase of Bulls		544,465	50,640	595,105
Re-establishment of Farmers	(m)	---	---	---
Grass Seeding & Experimental Regrassing		645,865	34,661	680,526
Total		<u>11,920,243</u>	<u>1,426,684</u>	<u>13,346,927</u>
<b>WATER DEVELOPMENT</b>				
Supervision		763,930	21,676	785,606
Small Projects including Engineering		14,771,809	883,309	15,655,118
Large Irrigation and Storage Projects				
Supervision	(d)	1,721,267	65,019	1,786,286
Construction and Improvements	(c & e)	7,428,049	638,387	8,066,436
Maintenance and Operation		5,499,889	348,407	5,848,296
Re-establishment of Farmers	(n)	199,083	1,821	200,904
Surveys and Explorations	(f & h)	1,660,484	---	1,660,484
Purchase of Land		727,003	10,547	737,550
Total		<u>32,771,514</u>	<u>1,969,167</u>	<u>34,740,681</u>
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).				
		4,966,394	---	4,966,394
GRAND TOTAL		<u>54,601,817</u>	<u>4,168,369</u>	<u>58,770,186</u>

# SPECIAL VOTES UNDER P. F. R. A. ADMINISTRATION

	1935 - 1956	1956 - 1957	Total
Assiniboine River, Surveys and Construction	484, 449	294, 744	779, 193
Lillooet Project B.C. Construction & Exploration	1, 170, 133	---	1, 170, 133
Land Reclamation & Development in B. C.	1, 889, 589	50, 460	1, 940, 049
St. Mary's Irrigation Project - Alberta	14, 862, 211	2, 855, 364	17, 717, 575
Bow River Project - Alberta	22, 477, 629	1, 496, 787	23, 974, 416
Red Deer River Project - Alberta	845, 284	54, 692	899, 976
Other Miscellaneous Projects - Construction	210, 392	---	210, 392
Land Protection & Reclamation - Manitoba	2, 124, 736	400, 756	2, 525, 492
South Saskatchewan River Project - Saskatchewan	3, 878, 476	219, 374	4, 097, 850
Buffalo Pound Project - Saskatchewan	615, 001	600, 784	1, 215, 785
Surveys and Engineering Costs	7, 068, 582	1, 682, 964	8, 751, 546
<b>GRAND TOTAL</b>	<b>55, 626, 482</b>	<b>7, 655, 925</b>	<b>63, 282, 407</b>

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388, 923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95, 198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300, 879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147, 530.22 expended on St. Mary Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325, 642 and South Saskatchewan \$370, 093 provided by Department of Reconstruction. In addition, the following amounts were paid from P. F. R. A. Vote: South Saskatchewan - \$59, 568; Red Deer - \$33, 207.
- (h) General Survey charges now being paid from other P. F. R. A. Votes.
- (i) Amounts shown in notes (d), (e) and (f) to be added to this total.
- (j) Veteran's Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P. F. R. A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).

EXPENDITURES BY PROVINCES  
 PRAIRIE FARM REHABILITATION ACT and SPECIAL VOTES UNDER ITS ADMINISTRATION  
 April 1, 1935 - March 31, 1957

	Manitoba	Saskatchewan	Alberta	British Columbia
P. F. R. A.				
Major Irrigation and Reclamation in the Prairie Provinces	4,555,415	43,225,414	7,009,974	
Land Reclamation, Construction and Development in B. C.	24,951	5,409,337	42,500,398	3,109,726
Land Protection and Reclamation	2,525,492			
Diking and Cut off (Assiniboine, Manitoba)	779,193			
Surveys and Engineering Costs	1,221,802	4,330,661	3,249,994	130,855
Administration	272,333	1,864,552	1,710,171	132,325
	<u>9,379,186</u>	<u>54,829,964</u>	<u>54,470,537</u>	<u>3,372,906</u>
				<u>122,052,593</u>

REVENUE  
 REVENUE RECEIVED FROM PROJECTS UNDER P. F. R. A. OFFICE  
 to March 31, 1957

Pasture Operation and General Revenue	4,699,245
Irrigation Project Operation (Under P. F. R. A. Vote)	545,310
Irrigation & General Revenue (Major Projects Vote)	<u>1,475,142</u>
<b>TOTAL</b>	<u><u>6,719,697</u></u>

APPENDIX VIII  
TOTAL IRRIGATION DEVELOPMENT - ALBERTA and SASKATCHEWAN

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet) )	
		Present	Ultimate Proposals		Present	Ultimate
<u>Mountain &amp; Foothill Region</u>						
United Irrigation Dist.	1921	21,000	34,000	Driggs Lake	7,500	7,500
Mountain View Irrigation Dist.	1925	3,600	3,600	Driggs Lake		
Leavitt-Aetna Irr. Dist.	1943	3,600	11,700			
MacLeod Irr. Dist.	1948	2,500	10,000			
Other		12,300	32,700			
Total		43,000	92,000			
<u>Western Prairie Region</u>						
St. Mary-Milk River Project	1901	260,000	510,000	St. Mary Reservoir	270,000	270,000
				Chin	50,000	150,000
				Jensen	14,000	14,000
				Ridge	-	80,000
				Verdigris	-	110,000
				Waterton	-	130,000
				Lake McGregor	75,000	250,000
				Travers	100,000	100,000
				Little Bow	12,000	12,000
				Chestermere	3,000	3,000
				Lake Newell	90,000	100,000
				Crawling Valley	-	120,000
				Keho	40,000	40,000
				Berry Creek Reservoir	30,000	30,000
				Ardley Reservoir	-	300,000
				Buffalo Lake	-	300,000
				Craig & Hamilton	-	250,000
Other		52,000	201,000			
Total		740,000	1,685,000			
<u>Central Prairie Region</u>						
French Flats-Valley Park	1949	700	6,000	South Sask. Reservoir	-	3,100,000
South Sask. Irr. Project	--	-	470,000	Delisle Reservoir	-	25,000
				Blackstrap Reservoir	-	25,000
				Loverna Reservoir	-	250,000
Red Deer Extension		-	200,000			
Other		13,300	14,000			
Total		14,000	690,000			



Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet) )	
		Present	Ultimate Proposals		Present	Ultimate
Cypress Hills Region						
Eastend-Val Marie Irr. Proj.	1937	10, 000	13, 000	Cypress Lake Eastend Val Marie Reservoirs Fifty Mile Reservoir	100, 000 2, 000 12, 000 -	100, 000 2, 000 12, 000 80, 000
Consul-Vidora Irr. Projects	1945	7, 000	10, 000			
Ross Creek Irr.	1949	2, 000	3, 000	Gros Ventre	4, 500	8, 000
Maple Creek Irr.	1936	5, 000	5, 000	Downie Lake	10, 000	10, 000
				Junction	10, 000	10, 000
				Harris	5, 000	5, 000
Swift Current Irr. Project	1940	12, 000	21, 000	Duncairn Highfield	85, 000 13, 000	85, 000 13, 000
Ponteix Project	1953	1, 000	3, 000	Gouverneur	10, 000	10, 000
Cadillac Project	1953	700	800	Cadillac	1, 500	1, 500
Lafleche Project	--	-	8, 000	Admiral	2, 500	2, 500
Other	--	67, 300	98, 000	Lafleche	Incomplete	30, 000
Total		105, 000	161, 800			
Eastern Prairie Region						
Lumsden-Fairy Hill Irr.	1910	3, 000	6, 000	Buffalo Pound Lake	40, 000	120, 000
Souris-Estevan-Kisbey Irr. Pro.	1937	5, 000	11, 000	Dead Lake	3, 000	50, 000
South Saskatchewan				Moose Mountain	9, 000	9, 000
Extension - Qu'Appelle	--	-	24, 000			
Other	--	20, 000	34, 000			
Total		28, 000	75, 000			
Total Irrigation (Alberta & Saskatchewan)		930, 000	2, 703, 800			





CANADA - DEPARTMENT OF AGRICULTURE  
PRAIRIE FARM REHABILITATION BRANCH  
REGINA - SASK.

UDSON  
BAY

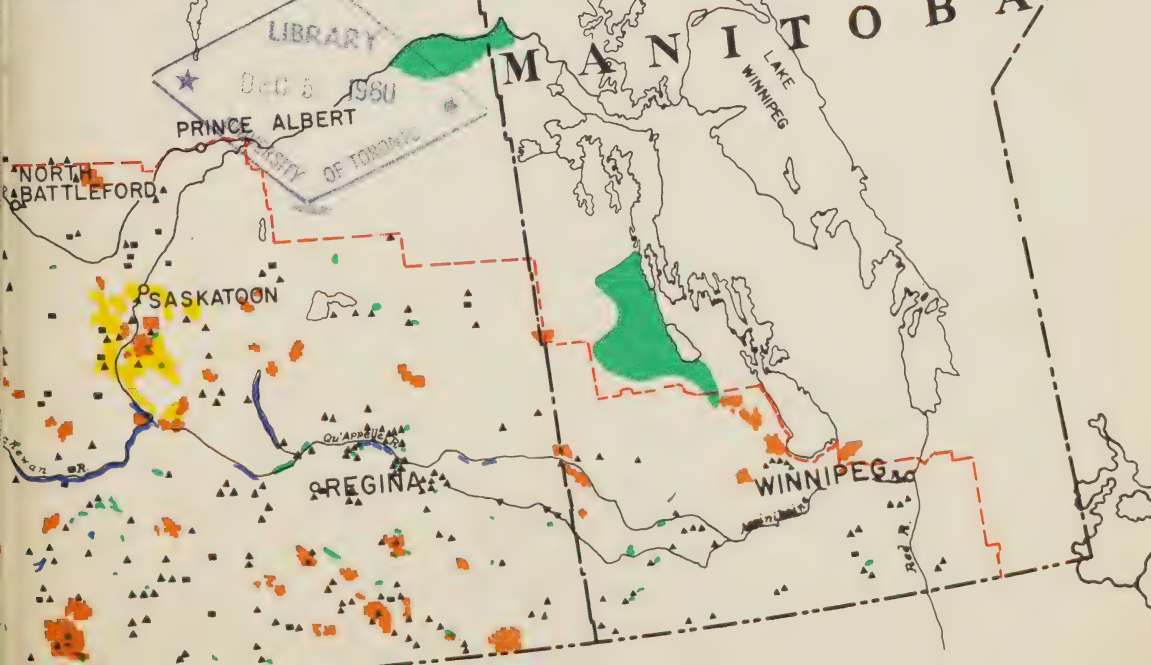
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# Annual Report

ON PRAIRIE FARM  
REHABILITATION &  
RELATED ACTIVITIES

SKATCHEWAN

MANITOBA







PRAIRIE FARM REHABILITATION

and RELATED ACTIVITIES

1957 - 1958



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## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed during the 1935 session of Parliament to provide for "the rehabilitation of the drought and soil drifting areas in the Provinces of Manitoba, Saskatchewan and Alberta". The object of this Act was to deal with an immediate problem of prolonged drought which was then having a severe effect on agriculture in Western Canada. In addition to the promotion of new and improved cultural practices, provision was made for the development of the surface water resources, for stockwatering and domestic use and also for the production of feed and seed supplies through irrigation. In 1937 the Prairie Farm Rehabilitation Act was amended to include land utilization and land settlement as additional objectives. By further amendment in 1939 this Act was extended to remain in force indefinitely.

The P.F.R.A. program is designed to bring about desirable adjustments in agricultural practices which will assist in establishing a sound and progressive agricultural economy in Western Canada. This program has already been effective in developing increased stability and security through the diversification of agricultural production. The conservation of water both on individual farms and in rural communities and the promotion of better land utilization will help minimize the effect of drought should a period of dry years return to the prairies.

The area within which P.F.R.A. operates covers approximately 105 million acres. In this area lies some 47 million acres of improved farm land which is more than half the total improved acreage in Canada.

The administration has also been made responsible for several large irrigation and reclamation projects outside the boundaries of P.F.R.A. These projects too have had a beneficial effect on the national agricultural economy by bringing into production, lands which formerly were of limited agricultural value.

Although this report will deal principally with the work done by P.F.R.A. in 1957, it will also review in a general way, the progress of the various programs and projects promoted by P.F.R.A. since its inception in 1935.





## ADMINISTRATION AND ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The Director's office is located at Regina, Saskatchewan, where headquarters for the administration has been established. In addition to the Director's Office the organization at Regina consists of the Water Development Branch, the Community Pasture Branch, and the Engineering Services Branch.

The Director's Office co-ordinates the activities of the different Branches and administers the Resettlement and Rehabilitation program. The Construction, Equipment and Supply Division; Land Division; Planning and Information Division; and Administration Division are directly responsible to the Director.

The Water Development Branch supervises the development of an extensive program of farm and community water storage projects, and numerous small scale irrigation schemes.

The Community Pasture Branch undertakes the construction of new pastures and supervises the operation and maintenance of the existing Community Pastures throughout Saskatchewan and Manitoba.

The Engineering Services Branch, composed of the following Divisions - Hydrology, Soil Mechanics, Design, Air Photo Analysis and Engineering Geology, Surveys, and Drainage - performs all engineering services for the investigation, design, and construction of all projects under P.F.R.A. administration.

In addition to the Head Office in Regina, there are nineteen District and Regional Offices and nine Project Offices situated throughout the Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and type of the project being administered by the Project Office.

Since P.F.R.A. activities are closely allied to those of certain Provincial Departments, every endeavour is made to co-operate with these agencies. Similarly the P.F.R.A. maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and the Water Resources Branch of the Department of Northern Affairs and National Resources.



## WATER DEVELOPMENT PROGRAM

One of the primary objectives of the Prairie Farm Rehabilitation Act was to introduce a water conservation program which would provide greater security to the agricultural population of Western Canada. The Act made provision for engineering and financial assistance in the developing of water resources for use on farms and in rural communities. This policy was adopted to encourage the conservation and development of water resources in areas where shortages had been experienced, thereby assuring a dependable supply of water for domestic use, for stockwatering and for the production of livestock feed by irrigation.

The water conservation program is under the supervision of the Water Development Branch. The projects administered by this Branch may be classified either as "farm projects", which include individual and neighbor projects, or "community projects", which include small community and large community types of development.

### Farm Projects

Direct financial assistance is available through P.F.R.A. to help individual or neighboring farmers in the conservation and storage of water on their farms by the construction of dugouts, dams or dykes. In addition, all engineering services are provided free



A farmstead in southeastern Saskatchewan where the water requirements are supplied by a well located dugout.



of charge. The responsibility for actual construction, however, remains with the individual or neighboring farmers who make application for assistance with the project.

The 1957 season was marked by a light runoff in the greater part of the P.F.R.A. area. This was followed by a season of generally light and irregular rainfall. As a result of these conditions, there was a large increase in the number of projects, particularly dugouts, constructed in 1957. (See Appendices I and II)



A farm dam in southwestern Saskatchewan used for stockwatering and small scale irrigation.

Ref. # 5403

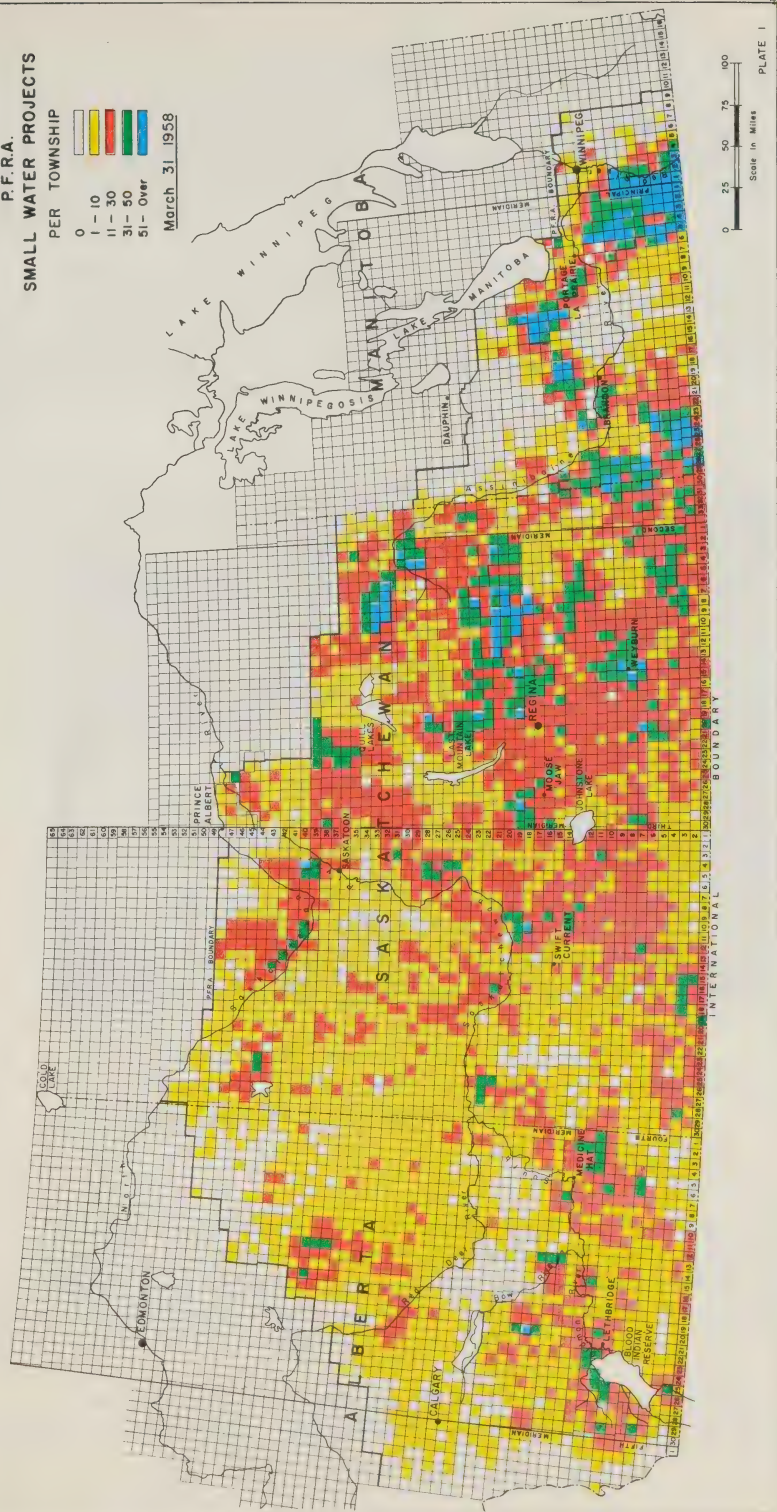
Twenty-five hundred and fifty-nine "farm projects" were established during the past year; 186 were in Manitoba, 1478 in Saskatchewan and 895 in Alberta. These brought the total number of "farm projects" constructed since the inception of P.F.R.A. to 56,094. The construction of these projects has made it possible to extend the benefits of water to farmers in all parts of the P.F.R.A. area irrespective of whether or not they are located on a well defined watershed.

The rates of financial assistance paid on "farm projects" remained unchanged during 1957. Assistance was paid on 2,198 dugouts, 212 stockwatering dams and 149 small irrigation projects; the average paid was \$109.87 on dugouts, \$97.26 on stockwatering dams and \$234.56 on irrigation projects, compared to a long-term average of \$107.55, \$88.15 and \$234.21 respectively. These payments in most cases represented one-quarter to one-third of the total cost of construction of farm projects.

P.F.R.A.  
SMALL WATER PROJECTS  
PER TOWNSHIP



March 31 1958







## Community Projects

In the development of water conservation projects on watersheds which have sufficient water to supply a number of farmers or even an entire community, P.F.R.A. in addition to supplying all engineering services, also assumes a larger proportion of the cost of construction.

"Small community" projects are built where groups of farmers wish to utilize the water of well defined watersheds on a community basis. Thirty-nine new "small community" projects were commenced in 1957 and all but 5 were completed during the year. Construction continued on 16 projects which had been started in previous years. In 1957 eleven of these projects were completed.



Grainger Dam located in central Alberta, a small community project supplying water for stockwatering and irrigation to the farmers of the district.

Ref. # 14454

In areas where there is a special need and sufficient community interest in water development, and where the Federal Government believes it is in the best public interest, "large community" projects are undertaken independently by the Government of Canada. During the year 1957 construction was completed on 7 "large community projects", some of which were started prior to 1957.

Community projects usually provide one or more of the following services: - stockwatering, water storage, flood control, irrigation and reclamation. Those serving



several purposes are termed multiple-purpose projects; others are designated according to their principal function. Of the 45 "small community" projects completed in 1957-58, 18 were stockwatering dams and dugouts, 22 were multiple-purpose reservoirs, 5 were flood irrigation and reclamation projects. With regard to the "large community" projects completed in 1957-58, the following is an outline of each, indicating the type of project, its location, purpose and use.

#### Lafleche Dam

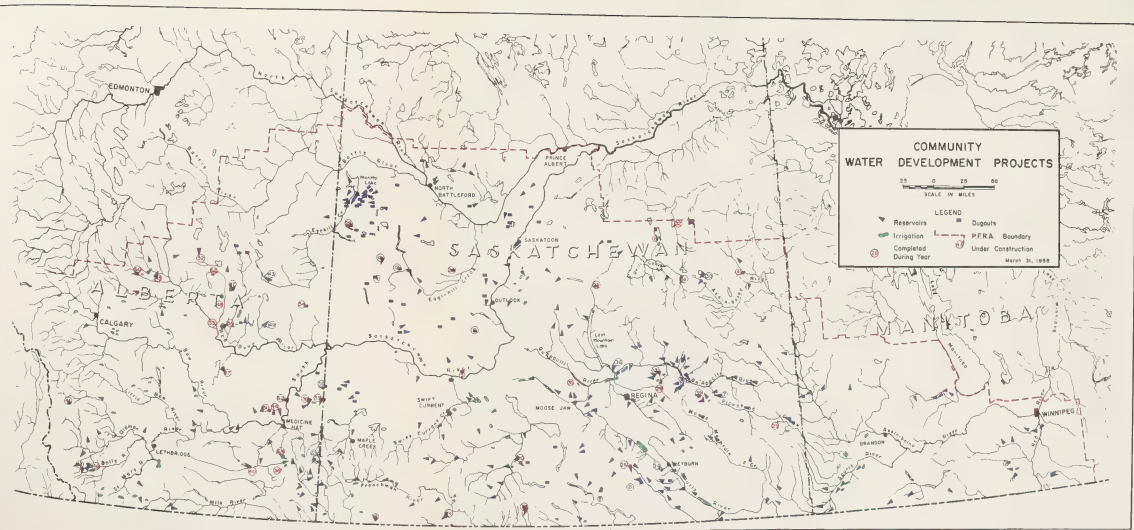
As a part of the development of the Wood Mountain watershed, a dam has been built on the Wood River between the towns of Lafleche and Gravelbourg to provide water for irrigation and stockwatering. The reservoir will store 30,000 acre feet of water, potentially available for the irrigation of about 15,000 acres of land between Lafleche and Johnston Lake.



Lafleche Dam, a large community project with a storage capacity of over 300,000 acre feet of water located in central southern Saskatchewan.

Ref. # 15308

The water stored by the Lafleche reservoir will also be used as a domestic water supply for community centres in the surrounding area. Construction was completed during 1957 and the reservoir was first filled in the spring of 1958.





### Moosomin Dam - Keenan Bridge

This dam on the Pipestone Creek south of Moosomin, was completed in 1954 but as a result of serious flooding of a municipal road associated with the reservoir, it was necessary to raise the road and reconstruct the existing bridge. This project improvement work was completed during 1957.



Keenan Bridge, over Pipestone Creek at its entrance to the Moosomin water storage reservoir. This reservoir was created by the construction of Moosomin Dam in 1954 by P.F.R.A.

Ref. # 15360

### Rock Lake Dam

To provide increased water storage for the Eastern Irrigation District, a dam has been constructed in the Rock Lake Coulee which converted this drainage basin into a water storage reservoir. The entire capacity of 11,000 acre feet of water is usable as there is no dead storage. This will be used to alleviate the water supply problem experienced during the peak of the irrigation season.

### Katepwa Weir

A weir was constructed at the east end of Katepwa Lake in 1888 for the purpose of raising and maintaining the water level of that lake and also of the three other lakes situated in the Qu'Appelle Valley just above Lake Katepwa. Although repaired and rebuilt several times, it became apparent that it was necessary to replace this weir with a larger and more efficient structure. The new weir has the same crest elevation as previously, but has greater length of crest and a larger control structure located lower in



the weir to provide a greater measure of safety should flood conditions appear imminent. This weir was constructed during the fall and winter of 1957-58 with construction being completed in January.



Katepwa Weir just after the construction was completed early in 1958. This weir will ensure more accurate control of the water level in the Fishing Lakes of the Qu'Appelle Valley.

Ref. # 15070

#### Dominion City Dam (Roseau River)

A dam constructed on the Roseau River east of Dominion City will regulate the flow of the river and will provide water for stockwatering during dry periods. The dam will raise the river level about 6 feet. The water storage created by this dam will be used for a domestic water supply for the Village of Dominion City. In an area where there is no other satisfactory water supply, it is estimated that 105 people will benefit directly and 700 indirectly, by this project.

#### Larsen Dam (Radville)

The Larsen Dam constructed as a combination stockwatering and water storage dam on a coulee leading into Long Creek about one mile north of the town of Radville, has a storage capacity of 500 acre feet. The water from this dam can be released down Long Creek and will benefit 50-60 farmers by relieving critical water supply problems during dry periods. It will also be used as a source of domestic water supply for the town of Radville.

### Little Manitou Lake - Diversion Canal

An open canal 7 miles in length has been constructed to divert the flood waters of Lanigan Creek through Fresh Water Lake, into Little Manitou Lake north of Watrous. This will provide some measure of flood control in Last Mountain Lake area and will assist in restoring and maintaining the level of Little Manitou Lake.

The following two "large community" projects were under construction on March 31, 1958: -

### Brownhill Dam

This water conservation project located on a coulee about 1-1/2 miles southwest of Grenfell, Saskatchewan, will have a storage capacity of 275 acre feet. Because of limited drainage area tributary to the dam, a controlled diversion ditch from Pipestone Creek 2-1/2 miles south of the site will divert flood flows from this creek to the reservoir. In addition to the storage of water for stockwatering and flood control, this reservoir will also be used as a source of domestic water supply for the Town of Grenfell.

### Valeport Dyke

The Valeport Dyke which was constructed in the early 1940s, was breached in 1948 to relieve flooding conditions at Lumsden. Re-construction of this dyke was begun late in 1957. The dyke will benefit approximately 1500 acres of hay flats and market gardens below Last Mountain Lake which have been subject to frequent flooding.

## Special Services

Work was continued on a number of special services originated in former years. During 1957, approximately 30,000 cuttings and seedlings were planted for reservoir protection and to establish snow traps.

In co-operation with the Experimental Farms Service, a program of investigating "evaporation control" on farm ponds was originated in Southern Alberta. Two plywood tanks located at Vauxhall and Manyberries were used to test the value of cetyl alcohol in reducing surface evaporation. Limited tests with cetyl alcohol were made on farm dugouts. Results indicated that investigations should be continued.

Contact and liaison was maintained with Ionics Incorporated of Cambridge, Mass., U.S.A. manufacturers of electric membrane demineralizers. It was hoped that a unit might be developed to serve individual or small communities whose available water supply is highly mineralized. Some progress was indicated during 1957 with the announcement by Ionics that it was commencing the manufacture of a unit which would be suitable for this purpose.

## Technical Assistance

In addition to financial assistance referred to in the previous sections the following free field services were provided by the Water Development Branch in 1957-58: -

	Agricultural Services	Engineering Services
Dugouts		
Preliminary calls	1,137	
Final inspections	2,028	
Miscellaneous inspections	425	
Stockwatering Dams		
Preliminary calls	285	
Final inspections	91	187
Miscellaneous inspections	161	773
Surveys completed	-	264
Plans prepared	-	254
Small Irrigation Projects		
Preliminary calls	442	-
Final inspections	75	126
Miscellaneous inspections	314	704
Surveys completed	-	163
Plans prepared	-	144
Community Projects		
Preliminary calls	184	-
Final inspections	41	-
Miscellaneous inspections	507	-
Projects investigated	-	218
Projects built	-	82
Surveys and plans prepared	-	69
Maintenance	-	79
Sub Totals	5,690	3,063
TOTAL		<u>8,753</u>

## COMMUNITY PASTURE PROGRAM

The work of the Community Pasture Branch commenced in 1937, following an amendment to the Prairie Farm Rehabilitation Act which broadened the scope of the Act to include land utilization and resettlement. Over the years this policy change has had a far-reaching effect on the type and stability of agricultural production throughout Western Canada.

By agreement with the Provinces of Saskatchewan and Manitoba, sub-marginal areas are leased to the Federal Government which agrees to finance the construction, maintenance, and improvement of pasture facilities in these areas. It is the responsibility of the provinces concerned to select the area to be developed and obtain control of the land. Under the P.F.R.A. Community Pasture program, many large areas of land proven unsuitable for cereal crop production have been regrassed and are now being used for livestock production.



A general view of the Kindersley Community Pasture headquarters showing the development of the grounds.

Ref. # 15760

Families located within the proposed pasture areas are given assistance to move to better land in the same or a neighboring municipality where they may derive a better living from farming and where they are in a position to take advantage of the pasture facilities. If land is not available in these areas, these farmers are assisted in moving to irrigation projects built by P.F.R.A. for resettlement purposes.



Since the inception of the Community Pasture program in 1937, a total of 1,796,275 acres of land have been developed for pasture use. Operated as 61 separate pasture units, this land provided spring, summer, and fall grazing for 119,398 units of livestock belonging to 5,763 patrons during 1957. Details regarding acreage, construction and operating costs, and the numbers of livestock pastured on individual pastures, will be found in Appendices IV and V of this report.

### Pasture Operations

The grazing season extended from the last week in April to the end of October. Conditions in the pastures during the 1957 season were generally good. The dry weather experienced to the end of June and again in the fall had an adverse effect on grazing and grass carry-over in some pastures. The water supply was fairly satisfactory even though during the last two months, the water was very low in some of the dams and dugouts. These were cleaned out and the smaller ones enlarged to improve future water supplies.



Headquarters of the new Fairview Community Pasture in west-central Saskatchewan. This pasture completed its first year of operation in 1957-58.

Ref. # 15772

### Pasture Services

As the cattle population per farm increases, the demand for summer pasturage continues to increase. This has created a problem for the various local Advisory Committees in allocating pasture privileges. In some pastures, to avoid over-grazing, it has been

SASKATCHEWAN

PRAIRIE FARM REHABILITATION ACT

AREA ENCLOSED IN 62 PASTURE UNITS

SASKATCHEWAN 1,648,125 ACRES

MANITOBA

TOTAL	1,803,885	ACRES
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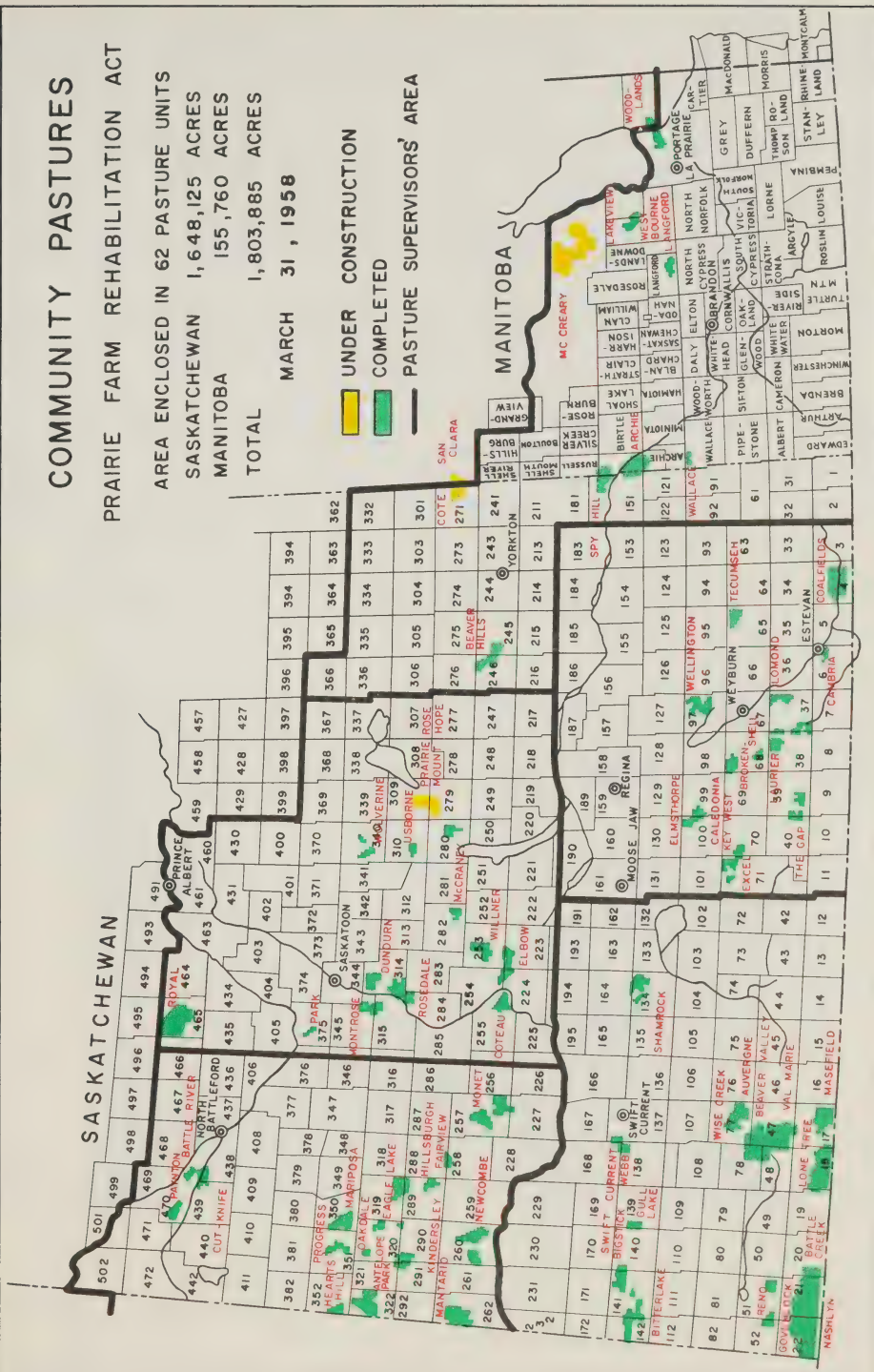
MARCH 31, 1958

## UNDER CONSTRUCTION

COMPLETED

## PASTURE SUPERVISORS' AREA

MANITOBA





necessary to reject applications from outside the municipality in which the pasture is located, and to limit the number of cattle accepted from any one patron residing within the municipality in accordance with the P.F.R.A. Community Pasture policy.

This year, due to the shortage of grass and water in farm pastures, some Committees accepted more cattle than normally. Due to the dryness of the season and the numbers of cattle currently being grazed, it became evident in the latter part of the season, that certain areas were heavily over-grazed. It will be necessary to give special consideration to this problem when pasture privileges are allocated for 1958.

Although dry conditions prevailed during part of 1957, the cattle came off the pasture in very good condition. Patrons generally were well satisfied with the gain in weight and the condition of their stock when they took delivery of them in the fall.

No serious outbreaks of disease affected the livestock in Community Pastures during 1957. All cattle affected by Warbles were treated on entering the pasture. Yearlings and calves were vaccinated against Blackleg, Malignant Edema and Shipping Fever. An effective program for the control of external parasites was carried out by using sprays and setting up treated back-scratchers.

Grazing and service fees remained unchanged in 1957-58. Salt and Hi-Amine were supplied to all pastures requiring them, at no extra charge.



Fall roundup on one of the P.F.R.A. Community Pastures in southern Saskatchewan with patrons waiting to take delivery of their cattle.

Ref. # 14276



The following is a schedule of pasture fees and service charges in effect during 1957-58: -

#### Grazing Rates

Cattle per month	0.75
Horses per month	1.00
Sheep per month	0.10
Cows (breeding service)	3.00
Colts born in pasture, flat rate	3.00 per season
Calves born in pasture, flat rate	2.00 per season
A minimum grazing charge equivalent to three months' fees will be levied against any animal recorded for pasturage.	

#### Rates for Vaccine and Sundry Services

Blackleg, Hemorrhagic and Mixed Vaccine	0.15 per single dose
Dehorning	0.50 per head
Warbles & Horn Fly Spraying (treatment at corral)	0.15 per head
Mineral Supplement	0.35 per head
Castration - Cattle under six months	1.00 per head
Cattle six months and over	2.00 per head
Encephalomyelitis and Special Vaccines	At cost

#### Fires and Fire Protection

Several grass fires mainly caused by lightning occurred during the year. The material damage experienced was light although a considerable acreage of grass was burnt off in different pastures. The assistance received from local fire fighting units helped keep the damage experienced to a minimum. To assist in controlling and to prevent the spread of fires, several hundred miles of fireguards were maintained by the use of motorized graders.

All buildings are equipped with approved fire extinguishers and are inspected periodically for fire hazards. No pasture buildings were destroyed by fire during the fiscal year.

#### Hay and Grass Seed

A total of 3,258 tons of hay were harvested in Community Pastures. This hay is used for feeding the pasture bulls and saddle horses.

Approximately 9,000 lbs. of Crested Wheat Grass seed and 37,000 lbs. of June Grass seed were harvested in 1957 from the Gull Lake and Lakeview Community Pastures respectively.

#### Regrassing

During the 1957 season, 3,712 acres were regrassed in 19 Community Pastures. This was made up of 630 acres of Crested Wheat Grass, 1,041 acres of Brome and Crested Wheat Grass and 2,046 acres of mixed grasses.

#### Breeding Services

As a requested service by pasture patrons, P.F.R.A. maintains a sufficient number of purebred bulls to provide adequate breeding service. The breed of bulls is based

on the majority vote of the patrons. In 1957 seven hundred and twenty-six bulls owned by P.F.R.A. and 202 bulls rented from pasture patrons, making a total of 928 bulls, were used in the breeding service. An estimated 90% calf crop resulted from 24,748 cows serviced. During the year P.F.R.A. purchased 23 mature bulls, 64 yearling bulls and 90 bull calves. The yearlings and calves are being developed at the Archie, Outlook and Bitter Lake Stations. One hundred and forty-two bulls unfit for breeding service were sold and 24 died from various causes during 1957-58.



A few of the bulls made available by P.F.R.A. for use in Community Pastures.

Ref. # 15862

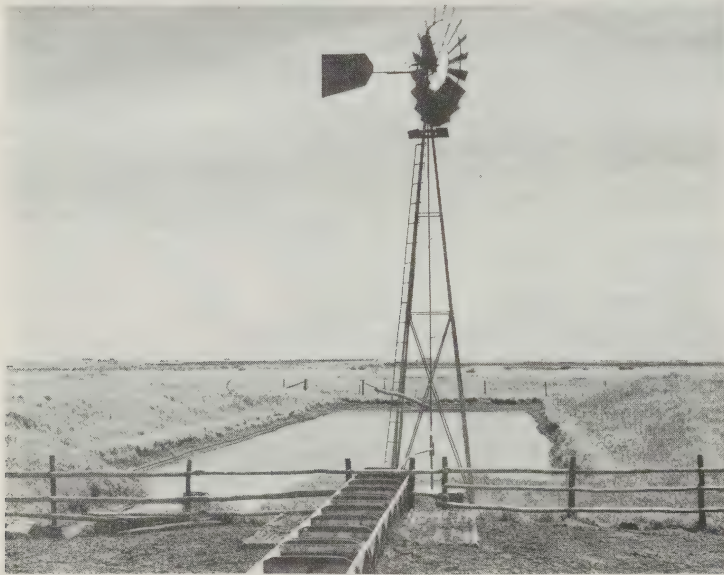
### Livestock Insurance

To offset losses by death which are inevitable in livestock production, a policy of livestock insurance is carried in the majority of Community Pastures. The total losses from all causes in 1957 were 631 cattle and 2 horses, which represents only about 1/2 of 1 percent of the livestock handled.

### Pasture Construction

For the purpose of maintaining and extending pasture facilities nine construction crews were employed by P.F.R.A. during 1957-58. In addition to the pastures in operation, construction work was done on 3 new pastures; - the Mount Hope-Prairie Rose pasture in central Saskatchewan at Semans, the McCreary pasture in the Riding Mountain area of Manitoba, and the Cote-San Clara pasture on the Manitoba-Saskatchewan boundary north of Togo, Saskatchewan. A total of 36,705 acres was added to the over-all acreage in 1957.

Throughout the construction season, two water development crews carried out an extensive maintenance program on domestic and stockwatering facilities in the various pastures. The new construction involved the erection of 28 windmills, the excavating of 6 dugouts and 1 combination dam and dugout, and the boring of 24 wells, of which 14 produced good supplies of water. The community pasture construction crews also fenced the canal right-of-way on the Buffalo Pound Lake project as well as some special fence construction in the resettlement area of Hays in Alberta.



A windmill used for pumping water for range cattle. Where this is feasible the usefulness of a dugout is extended and contamination of the water is reduced.

Ref. # 15784

Following is a table showing the new construction and repair work completed during 1957-58: -

Particulars	Projects Completed in 1957	Repair Work Completed in 1957	Total to March 31, 1958
Fencing (miles)	120-1/2	145-1/2	4307
Corrals	4	8	160
Pasture Managers' Dwellings	4	4	55
Riders' Cabins	2	5	33
Barns	4	-	55
Garages	5	-	55
Bull Sheds	6	-	47
Others (Granaries, Oil Sheds, Chicken Houses, Pump Houses)	9	1	158



## Pasture Improvement

Lands turned over to P.F.R.A. to be developed into Community Pastures are usually composed of either overgrazed pasture land and/or tracts of abandoned cultivated land in a weedy and drifted condition. In addition, from a standpoint of pasturage, the areas are inadequately supplied with water. Development of these areas for pasture must include fencing, the regrassing of overgrazed and cultivated areas, and the establishment of adequate watering facilities in the form of dams, dugouts, wells and springs.

In low rainfall areas Crested Wheat Grass is used most extensively for regrassing purposes due to its drought tolerance and suitability for early spring grazing. This latter feature makes it ideally suited for use in rotation with native grasses which produce their heaviest yields after the 15th. of June if protected earlier in the season.

Stockwatering sites are located as nearly as possible within 1 mile of each other in bush country and areas of rough topography, and 1-1/2 miles in open range. It has been found that cattle travelling greater distances to water do not make normal gains in weight. The proper positioning of stockwatering sites is also a major factor influencing the distribution of cattle in pastures and the evenness of grazing over a pasture area.

Finally, the policy of P.F.R.A. to maintain a 50% carryover of grass cover from year to year where ever it is possible and feasible has been an important factor in preventing overgrazing in pastures and maintaining pasture grass in a healthy, vigorous condition.

To keep up to date with advances in range management, P.F.R.A. has established a special Pasture Improvement section under the supervision of the Community Pasture Branch. This section plans and carries out an investigational and work program designed, through the application of agricultural and engineering principles, to further increase the carrying capacity and to improve the drought resistance of grass land in community pastures. This program, which has now extended into 44 pastures is being carried out in close co-operation with the Experimental Farms Service. Production measurements are taken under supervision of the Experimental Farms Service to determine the increased production of improved areas.

Community Pastures operated by P.F.R.A. are located either in the open plains of southwestern Saskatchewan or in the parkland region of central Saskatchewan and Manitoba.

In the open plains region which is characterized by low precipitation and high evaporation, water conservation has proved to be the most important single factor affecting grass production. During 1957, 19 dams and 13 dugouts were constructed, 6 springs were developed and 6 dams were repaired. In addition to the development of stockwatering facilities, practices based on ways of conserving and utilizing the available supplies of moisture for increased grass production are being investigated. These include water spreading methods, surface and deep pitting, and controlled flood irrigation. Approximately 1240 acres were improved through various water conservation methods in 1957.

Water spreading by dykes and contour furrowing increases the effective utilization of water resources in an area. It also provides protection for dams, dykes and irrigation works in the lower reaches of a drainage area by slowing and reducing the rate and amount of runoff from rapidly melting snow or heavy rains. During the year studies were continued on the areas where water spreading systems have been established.



Shallow pitting and deep pitting are methods of creating numerous small water retaining basins in the soil, thereby making it possible for a greater amount of water to be absorbed by the soil. In 1957, 256 acres of land in the Caledonia pasture were pitted to check the efficiency of this operation.

In some areas of the pastures it is possible to develop flood irrigation schemes. These add to the over-all production by encouraging grass growth during dry periods when grass production in the pastures is generally reduced. Several flood irrigation schemes were advanced in development. These included Lonesome Lake and Lewis Flats in the Reno #1 pasture, Dixon Slough and the Border Sloughs in the Battle Creek Pasture, Dry Lake in the Beaver Valley Pasture and the Govenlock dyke irrigation scheme in the Govenlock Pasture, involving collectively an area of 3000 acres.



Contour furrows constructed in Val Marie Community Pasture as a moisture conservation measure to increase rangeland carrying capacity.

Ref. # 13975

The main problems facing Pasture Improvement in the parkland region is one of land clearing rather than water conservation. With the control of grass fires in the parkland area, native trees and brush soon establish themselves, greatly reducing the amount of grass produced and increasing the difficulty of maintaining pasture facilities. Efforts are concentrated in finding an economical way to open up this land for grazing, and to protect pasture facilities from the invasion of trees and brush. Every method and new technique in land clearing has been used in an attempt to determine the most economical procedure to adopt for large scale operations.

Land clearing methods vary in accordance with the size and density of the natural tree growth. The following methods have been used: -

1. Serrated disc implement for brush and light tree growth.
2. Rotary brush cutters for growth up to 3-1/2" stem diameter.
3. 'V' shaped cutter to cut down heavy growth in the summer.
4. Bulldozers to knock down heavy growth during winter.
5. Piling of cut or knocked down growth for burning.
6. Chain and cable to knock down and windrow heavy growth.
7. Controlled burning of knocked down and piled growth after good native grass cover is established.
8. Controlled burning of standing growth.
9. Herbicidal spraying by aircraft.



Clearing small tree growth with a rotary brush cutter mounted on the front of a small tractor.

As soon as the tree growth is removed in the Parkland area, native grass responds immediately to the direct sunlight resulting in an abundant growth during the first year after clearing. Where the growth is knocked down and not piled, grazing is not possible until the brush has been burned which can usually be done after two to three years. Piling, windrowing, burning of the standing growth where possible, or aerial spraying, permits limited grazing the same year. Aerial spraying is usually confined to the control of regrowth of trees and brush in cleared areas and along fireguards. During 1957, 8688 acres of land were cleared by various land clearing methods.

## REHABILITATION AND RESETTLEMENT

The Prairie Farm Rehabilitation Act was passed to rehabilitate the farming population of the Canadian prairies, which following the drouth and depression of the early 1930s was left destitute. One of the first steps to rectify this situation was the development of a water conservation program to overcome the immediate problems of farm water supply. As a result of this program which provides financial and engineering assistance to farmers for the construction of water conservation facilities, many farmers have been able to rehabilitate themselves without moving to new locations.

In addition to this type of rehabilitation, the Government of Canada constructed several community irrigation projects in some of the driest areas in southwestern Saskatchewan. The irrigated land associated with these projects has been divided into 40-acre plots and made available to the farmers in the surrounding area for the production of livestock feed. By providing an assured supply of feed for livestock even when dry land crops failed, these projects have helped stabilize the agricultural economy throughout the areas in which they are located.

Where it has not been possible to affect the rehabilitation of farmers on the land they are operating by assisting them to develop an adequate farm water supply, or in the drier areas, through the development of community irrigation projects, farmers are assisted in moving to new locations. Where dry land farms are not available at a convenient distance, the Government of Canada through P.F.R.A., will assist in moving farmers and their effects to irrigated land in Alberta that has been acquired to accommodate farmers in need of resettlement.

Following is an account of the irrigation projects in Saskatchewan and Alberta which were built for rehabilitation and resettlement of prairie farmers and which P.F.R.A. continues to operate on behalf of the Government of Canada.

### Val Marie Irrigation Project

One of the first irrigation projects built by P.F.R.A. for rehabilitation and resettlement purposes is located on the Frenchman River near the Town of Val Marie in southwestern Saskatchewan. The Val Marie Irrigation Project contains about 4300 acres of irrigable land. Irrigation water for this project is gathered from the Cypress Hills and is stored in the Cypress Storage Reservoir well up in the Cypress Hills at the headwaters of the Frenchman River. A dam near Val Marie on the Frenchman River provides local storage for the irrigation water used on the project.

The 4300 acres of irrigated land on the Val Marie project were cropped under various agreements by 84 farmers during 1957. Approximately 5350 tons of feed were produced which is sufficient to supplement the winter feed requirements of the farmers using the project. The average production of forage crops has increased uniformly from an average of 1.0 tons per acre in 1954 to an average of 1.4 tons per acre in 1957. This increase can be attributed to one or more of the following: - improved distribution of water, improved drainage, new hay stands coming into production and a general desire of the farmers



to produce the maximum quantity of hay. Some 500 acres of irrigated land has been fenced for winter grazing by the individuals owning the land.

P.F.R.A. crews and equipment carried out the required maintenance and improvement work during the year. In addition, 600 feet of main canal east of the Town of Val Marie were relocated and lined with compacted clay. The toe of the canal bank next to the river was stabilized by driving piles along the bank next to the stream and a river diversion below Val Marie Reservoir begun in 1955 was completed.



Cypress Lake storage reservoir with the main canal, hay flats, Frenchman River channel and diversion canal, left to right in the foreground.

Ref. # 13955

### West Val Marie Irrigation Project

The West Val Marie Irrigation project is located west of the Val Marie project and uses water from Cypress Storage Reservoir via the Frenchman River. The West Val Marie dam provides local storage for irrigation for approximately 3500 acres of land. A portion of the area involving some 800 acres which can be partially irrigated, is fenced and cross-fenced for use by the Val Marie Community Pasture. The remainder is subdivided into fields and rented out for hay under lease or hay permit. The land fronting on the Frenchman River is further subdivided to provide building sites for farmers wishing to move on to the project. Eight of these building sites are now occupied by full time

resident farmers. The remaining proposed subdivisions are let out on a yearly agreement similar to other forage land on the project.

During 1957, forty-three farmers leased 2250 acres and produced 3440 tons of feed averaging 1.6 tons per acre as compared to 2.3 tons per acre in 1956. The decreased production was attributed to inadequate irrigation to compensate for a lack of fall and spring moisture and to the relatively cold late spring in that area.



General view of the irrigated area on the West Val Marie Irrigation project.

Ref. # 13985

In the irrigated pasture area reserved for use by the Val Marie Community Pasture a 450 acre field which has been cross-fenced into two pastures, carried 700 head of cattle for one month while a smaller 350 acre pasture carried 195 head for two weeks. Four hundred head of cattle grazed the entire project during December and January. The majority of these cattle are fed and sheltered in the willows along the river when the weather becomes too severe for open grazing. The manager of the Community Pasture supervises the grazing and pasturing operations in the irrigated pasture area.

A power line was constructed through the project in 1957 linking the established farmers, irrigation headquarters, and pasture headquarters to the main power line operated by the Saskatchewan Power Corporation.

## Eastend Irrigation Project

The Eastend Irrigation Project which consists of 3300 acres of irrigable land, is situated in the Frenchman River Valley 60 miles northwest of Val Marie. The irrigated area extends for fifteen miles southeast of the Town of Eastend. Water for this project also is obtained from the Cypress Storage Reservoir with local storage being provided by the Eastend Reservoir.

During the 1957 season, the 42 farmers at Eastend irrigated 2180 acres, producing 2200 tons of forage which will be used to supplement the feed requirements of 3200 head of cattle and 2200 head of sheep owned by the farmers using the project. There are now 1100 more acres in forage on the project than in 1953 and 1400 more head of cattle.

Many areas of this project require levelling so that the water may be used more efficiently. During 1957 P.F.R.A. assisted the farmers to level some 200 acres of irrigated land. Other repair work associated with canal maintenance was carried out by P.F.R.A. crews. The Uglum extension to the Eastend Irrigation Project purchased by P.F.R.A. in 1956 was further developed during 1957. In addition to the 450 acres owned



Irrigation flume for the Uglum extension with the town of Eastend in the background.

Ref. # 14109

by P.F.R.A., 150 acres of privately owned land can be supplied with water by this



extension. The soil in areas where alkali salts limit growth, has improved during the period from 1952 to 1956. The improved drainage, combined with limited irrigation due to excessive rainfall, has resulted in natural leaching of the salts from the soil surface.

During the summer of 1957, low rainfall and hot weather increased the evaporation in a seepage area commonly called "The Lewis Site" causing the salt condition in this area to increase. If a series of dry years should continue, alkali could become a serious problem in this area. Intensive work is being conducted by the Drainage Division of P.F.R.A. to reclaim alkali areas and to prevent any increase of alkali by reducing canal seepage.

### Consul Irrigation Project

The Consul area is a semi-arid region, slightly drier than other tracts of range-land in southwestern Saskatchewan. The region is ideally suited for raising cattle when a reliable source of feed is available. Irrigation has made it possible to produce forage crops in this area. The irrigation water is obtained from Cypress Storage Reservoir via a series of canals. The Consul Project contains approximately 3580 acres of irrigable land which are operated by 51 plot holders. About 2900 tons of forage were produced on the project during 1957. This will be used to supplement the winter feed requirements of about 3500 head of cattle and 1500 sheep. Hay harvested from the irrigation project averaged 1.5 tons per acre. The total production was much higher, however, as 35% of the second crop was left for fall grazing. There has been an increase of about 800 acres of forage crops on the project since 1954.

During 1957-58, normal maintenance work such as clearing and repairing ditches and canals, controlling weeds and regrassing ditch banks was carried out by P.F.R.A. crews. In addition, farmers on the project were assisted in levelling some 300 acres of irrigable land. This will help prevent future drainage and alkali problems. To provide improved drainage throughout the project many surface drains were constructed in 1957.

### Maple Creek Irrigation Project

The Maple Creek Irrigation Project is located north of the Cypress Hills in the Maple Creek area. Irrigation water for this project is obtained from run-off on the northern slopes of the Cypress Hills. By storing this water in strategically located reservoirs along the various stream courses it is possible to irrigate some 10,000 acres of land, 4800 acres of which are owned by the Government of Canada and 5200 are owned privately. The irrigated area is comprised of the Maple Creek Flats west of the town of Maple Creek, the Upper "V" and Lower "V" areas 20 miles north of Maple Creek and several private flood schemes along the various water courses flowing from the slopes of the Cypress Hills.

The Maple Creek area is a semi-arid region, subject to strong chinook winds causing a high rate of evaporation. A large percentage of the soils in the area are very light in texture and have a low moisture holding efficiency. Under dry land conditions



this land would produce very little feed for winter use. The 10,000 acres under irrigation on this project produces an average of more than 2 tons of feed per acre each year. The farming economy of this area has been greatly improved as irrigation makes it possible for the ranchers to carry an increased number of cattle.



Oats in swath grown as a companion crop with 1st. year Alfalfa in a border dyke irrigated area on the Maple Creek Flats.

Ref. # 15034

This project provides an assured feed supply for a livestock population of 10,000 cattle and 2000 sheep owned by 133 farmers using the project. Over 13,000 tons of alfalfa were produced on irrigated land during 1957. In addition, a portion of the Upper "V" grazed 900 head of cattle for a period of 4 months. In 1957, due to the rainfall in the latter part of June and a cool period during the second irrigation, higher crop yields were obtained than in 1956. Irrigated hay plots average over 2-1/2 tons per acre and the improved border dyke and ditch schemes yielded as high as five tons per acre of alfalfa from two cuttings.

Much of the work carried out by project personnel during 1957 was devoted to project improvement. Farmers were assisted to level their land, many worn out irrigation structures were repaired or replaced and canals were cleaned and repaired.

Work was continued during 1957 to reclaim areas on the project, particularly on the Upper and Lower "Vs" which have become alkaline and unproductive. The

work on the electric pumps was completed and they will be in operation early in 1958.



Second cut Alfalfa bales in an area irrigated by the border dyke system on the Maple Creek Irrigation project :

Ref. # 15035

### Swift Current Irrigation Project

The irrigated land of the Swift Current Irrigation Project is located east of the city of Swift Current and is supplied with water by the Swift Current Creek which rises in the northeastern slopes of the Cypress Hills. There are approximately 20,000 acres of irrigable land on this project with about 12,000 acres undergoing development at the present time. The Swift Current, Herbert and Waldeck Irrigation districts purchase water at a nominal fee from P.F.R.A. but otherwise operate independently. The Rush Lake project is operated by P.F.R.A. for the Government of Canada.

The North Rush Lake district with an area of about 4700 acres of irrigable land is divided into 20 and 40 acre plots and leased to farmers in the surrounding area. During 1957, one hundred and thirty-six farmers produced 6795 tons of feed and 8700 bushels of coarse grains on these plots. Due to the dry season, 6300 acre feet of water were required for irrigation. This is more than was used in any previous year.

The South Rush Lake area contains approximately 1680 acres of land which has not been developed for summer irrigation but is flood irrigated during the spring. A three-year forage seeding program was started in 1956 and by the end of 1957-58, one thousand and forty-five acres had been seeded to a forage crop mixture. Fifty-one farmers produced 850 tons of feed and 6000 bushels of coarse grains in the South Rush Lake area during 1957.

The feed produced in the Rush Lake Flats is used to supplement the winter feed requirements of 12,000 head of cattle owned by 187 farmers. Since 1951 there has been an 80% increase in the cattle population in the area surrounding the Rush Lake Flats.



A Brome grass and Alfalfa mixture grown on the North Rush Lake Flats of the Swift Current Irrigation project.

Ref. # 11036

A P.F.R.A. project crew was steadily employed in repairing and installing structures and in maintaining and clearing supply and drainage canals and ditches. To control seepage and excess water problems as they appear, additional surface drains were constructed and older drains were improved. In addition, the agricultural development program of land levelling and the establishment of forage crops was continued through 1957.

The development of the potential irrigable areas in the Waldeck, Herbert, and Swift Current districts is under the direction of the Saskatchewan Department of Agriculture. Water for irrigation in these districts is supplied from the Herbert, Highfield, Lac Pelletier and Duncairn Reservoirs.







# BOW RIVER PROJECT

## RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1958

### LEGEND

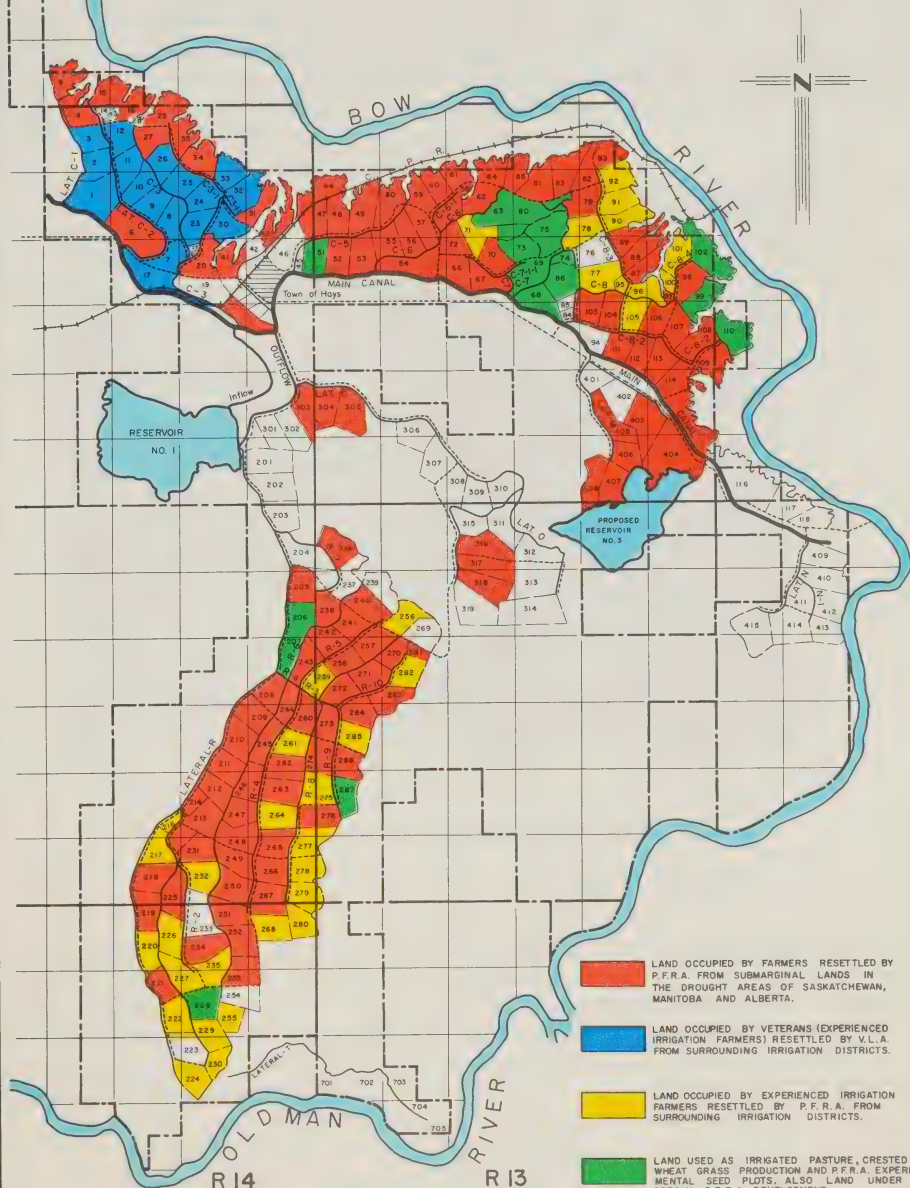
-  CANAL
-  ROAD
-  LOT BOUNDARY
-  DISTRICT BOUNDARY





T 15

T 14

T 13

T 12



-  LAND OCCUPIED BY FARMERS RESETTLED BY P.F.R.A. FROM SUBMARGINAL LANDS IN THE DROUGHT AREAS OF SASKATCHEWAN, MANITOBA AND ALBERTA.
-  LAND OCCUPIED BY VETERANS (EXPERIENCED IRRIGATION FARMERS) RESETTLED BY V.L.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND OCCUPIED BY EXPERIENCED IRRIGATION FARMERS RESETTLED BY P.F.R.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND USED AS IRRIGATED PASTURE, CRESTED WHEAT GRASS PRODUCTION AND P.F.R.A. EXPERIMENTAL SEED PLOTS, ALSO LAND UNDER SPECIAL P.F.R.A. DEVELOPMENT.





## Bow River Resettlement Project

On the Bow River project, 27,000 acres of land now known as the Hays District, are being developed into irrigated farm units for the resettlement of farmers from submarginal farms throughout the P.F.R.A. area. Twenty farm families were moved to the Hays District during 1957-58, bringing the total number of settlers into the district since 1952, to 178. Twelve of the 20 farmers moved were from Saskatchewan while the remainder were from the McCreary district of Manitoba. This was the first time Manitoba farmers in need of resettlement have been moved to the Hays District. This movement, carried out under the established P.F.R.A. resettlement program, involved moving farm families and their effects up to 700 miles. To assist in this move, all livestock was transported by trucks owned and operated by P.F.R.A.



The new home and farmstead of a settler on a unit of irrigated land in the Hays district of the Bow River project.

Ref. # 13958

In order to qualify for resettlement the farmer must exchange at least 160 acres of dry land for the farm unit of irrigated land he wishes to acquire. The exchanged dry land is regrassed by P.F.R.A. and if it is located outside the boundaries of a Community Pasture, the regrassed land is leased for hay and pasture purposes to farmers in the surrounding area. During 1957-58 one thousand seven hundred and ninety-seven acres of exchanged land was seeded to grass.

## MAJOR IRRIGATION AND RECLAMATION PROJECTS

The Prairie Farm Rehabilitation Act through its various programs is generally meeting the immediate needs of the prairie farmer. In recent years, however, attention has been given to the construction of large irrigation and reclamation projects involving the development of thousands of acres of land. This is in line with Canada's long-range land use plan to provide for the expansion and stability in Canada's growing economy. These projects are undertaken by agreement between the Federal Government and the Provincial Government concerned, on a cost sharing basis. The development of large irrigation and reclamation works in Western Canada is not included under the regular P.F.R.A. appropriation but authorized separately by special vote of Parliament.

### ST. MARY IRRIGATION PROJECT

The St. Mary Irrigation project was started at the turn of the century, when a simple diversion on the St. Mary river near the International Boundary was built by the Northwest Irrigation Company to bring water for irrigation to lands in the Magrath-Lethbridge region. Under this plan nearly 120,000 acres of land were developed for irrigation by 1925. At times, however, lack of storage facilities caused water shortages to develop particularly during peak irrigation seasons. To correct this situation, and also to enormously expand the project, the P.F.R.A. began construction of the St. Mary reservoir on the St. Mary river in 1946.

As now planned the St. Mary Irrigation project is expected ultimately to contain 500,000 acres of irrigated land. The area is limited by the water supply, which is confined to that available from the Waterton, Belly, St. Mary and Milk rivers. To utilize Canada's share of these four important international rivers, the Government of Canada and the Province of Alberta are jointly developing this project in southern Alberta.

The agreement between the Federal and Provincial Governments provides that the P.F.R.A. would finance the main reservoirs and connecting canals, while the province would finance the distribution system. All planning, engineering and administrative work involved in the development of the entire project, including the provincial portion, remains the responsibility of P.F.R.A.

During the last eleven years P.F.R.A. has financed and constructed the following works: -

- Belly River Diversion Dam
- St. Mary Reservoir
- Pothole Reservoir
- Ridge Reservoir
- 55 miles of connecting main canal

The Provincial Government has financed the following works: -

- Chin Reservoir
- Horsefly Lake Reservoir
- Rattlesnake Reservoir







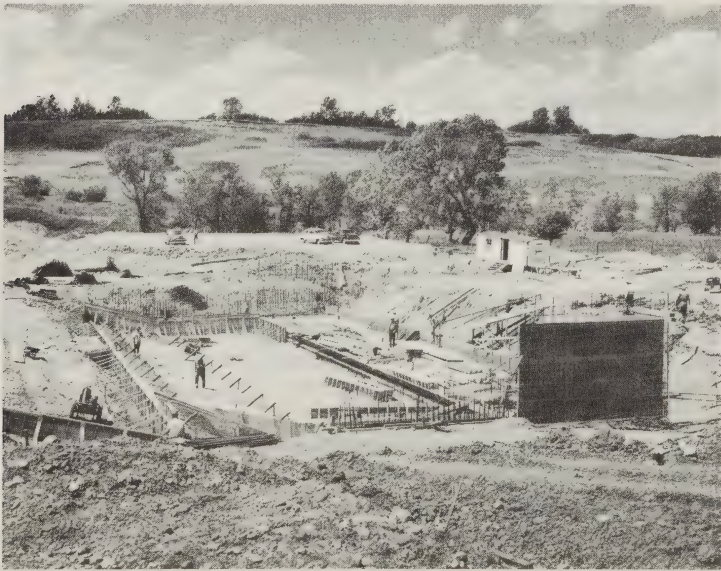
Murray Reservoir  
194 miles of main canal  
Distribution system to serve 176,000 acres

### Investigations

In 1957 the engineering staff was engaged chiefly on investigation and design of the proposed Waterton Dam and diversion canal. Plans and specifications were also prepared for the distribution system in the Cameron Ranch tract which covers about 8000 acres of irrigated land.

### Construction and Maintenance

During 1957 several construction contracts were completed. These included East Ridge Dam and the Belly River Diversion canal. Construction work on the Belly River Diversion Dam and Pothole Coulee spillway will not be completed until 1958. Maintenance work was confined mostly to riprap protection below the tailwater control structure on Division 3, as well as minor repairs on timber bridges.



Belly River diversion weir under construction.

Ref. # 13695

## Project Improvement

Repairs and alterations were made on a number of works already in operation. These included the replacement of part of the timber catwalk with concrete in the St. Mary Diversion tunnel, continued grouting of the abutment of St. Mary dam to reduce seepage in the vicinity of the spillway and the improvement of the drainage systems under two drop structures in Division 5.

## Operation

Headgates at the St. Mary dam were opened on May 7th. and dry weather resulted in the canal flow reaching 2400 cubic feet per second on June 7th. In this area irrigation was necessary to germinate many of the crops. In the older districts where specialty crops have become established, water was used steadily throughout the season. The following table shows the development of the project and the annual water consumption since 1952: -

Season	New works constructed to serve	Old district served approx.	Water delivered to a total of	Water delivered acre feet
1952	37,000 ac.	118,000 ac.	130,000 ac.	186,000 ac. feet
1953	54,000	118,000	135,000	196,000
1954	96,000	118,000	158,000	246,400
1955	141,000	118,000	159,700	190,000
1956	168,000	118,000	149,000	202,430
1957	176,000	120,100	169,900	314,493
1958	176,000			

## Agricultural Development

In the more recently developed areas of the St. Mary project irrigation has been confined to pastures and to hay crops. In 1957, as a result of dry conditions, some grain crops were irrigated. The amount of land devoted to specialty crops is increasing gradually.

In the older districts of the project, specialty crops are firmly established and livestock production in these areas is increasing rapidly. The following acreages were grown in the Lethbridge area in 1957: -

Green vegetables	-	1,200 acres
Canning vegetables	-	8,000 "
Potatoes	-	4,800 "
Sugar beets	-	38,000 "

The average yield of potatoes was about 7-1/2 tons per acre with an average price of \$48.00 per ton being received by the farmer.

Although the average yield of sugar beets was the highest yet recorded, 13.43 tons per acre, the sugar content was down from 16.33% to 14.67%. This was considered to be due to the cold wet weather in October.



Harvesting a bean crop grown under irrigation near the Taber sugar factory.

Ref. # 13863

Livestock production in the irrigated areas continued to increase with many farmers now operating their own feedlots. Sales at the Lethbridge stockyard for the past 3 years reflect this trend.

Year	Cattle	Calves	Hogs	Sheep	% increase
1955	46,815	10,008	55,863	12,094	
1956	54,735	12,048	61,155	12,595	12.7%
1957	69,035	14,380	65,389	13,918	15.8%

### BOW RIVER IRRIGATION PROJECT

In 1950 the Government of Canada purchased the holdings of the Canada Land and Irrigation Company which now forms the basis for the present Bow River Irrigation Project. Of the 240,000 irrigable acres in this project, the Company had developed about 57,000 acres. The Government of Canada, through P.F.R.A., proceeded with the task of renovating and enlarging the existing works and extending irrigation to a greater acreage. In addition, the responsibility for agricultural development and land settlement of the areas surrounding Vauxhall and Hays, was assumed by the Government of Canada.

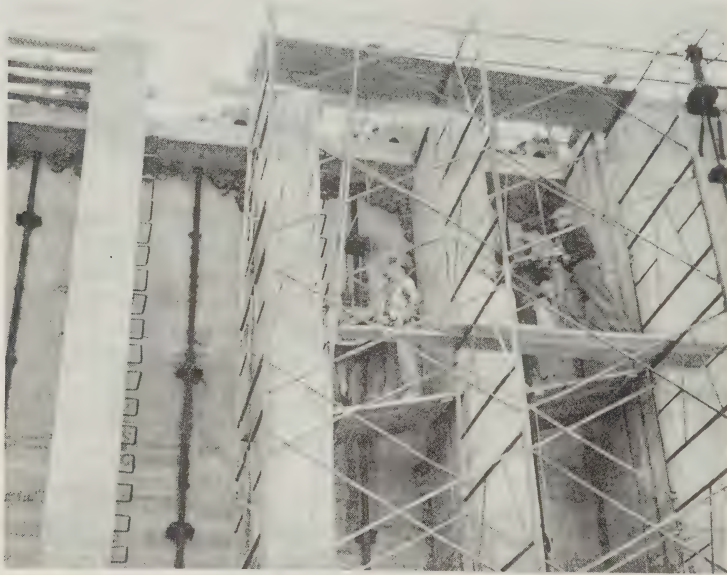
The renovation and enlarging of the original facilities is now practically completed. The Development of the land and irrigation facilities is also well advanced. The



main work still to be completed is in the West Block where some 80,000 acres are currently being developed by the Province of Alberta. Engineering assistance is being given by P.F.R.A. in the planning, investigation and design of irrigation structures as well as in the preparation of specifications for construction, and the drawing up of construction material lists.

### Construction and Maintenance

Two large contracts, which will complete the initial phase of renovations were awarded in 1957. The first was to increase the storage capacity of Lake McGregor by strengthening the South Dam and involved the raising of Lomond Crossing. This work was finished in 1957-58. The second was for the construction of Drop 7A which is to be completed in 1958. In addition, 3 new bridges were built during the year.

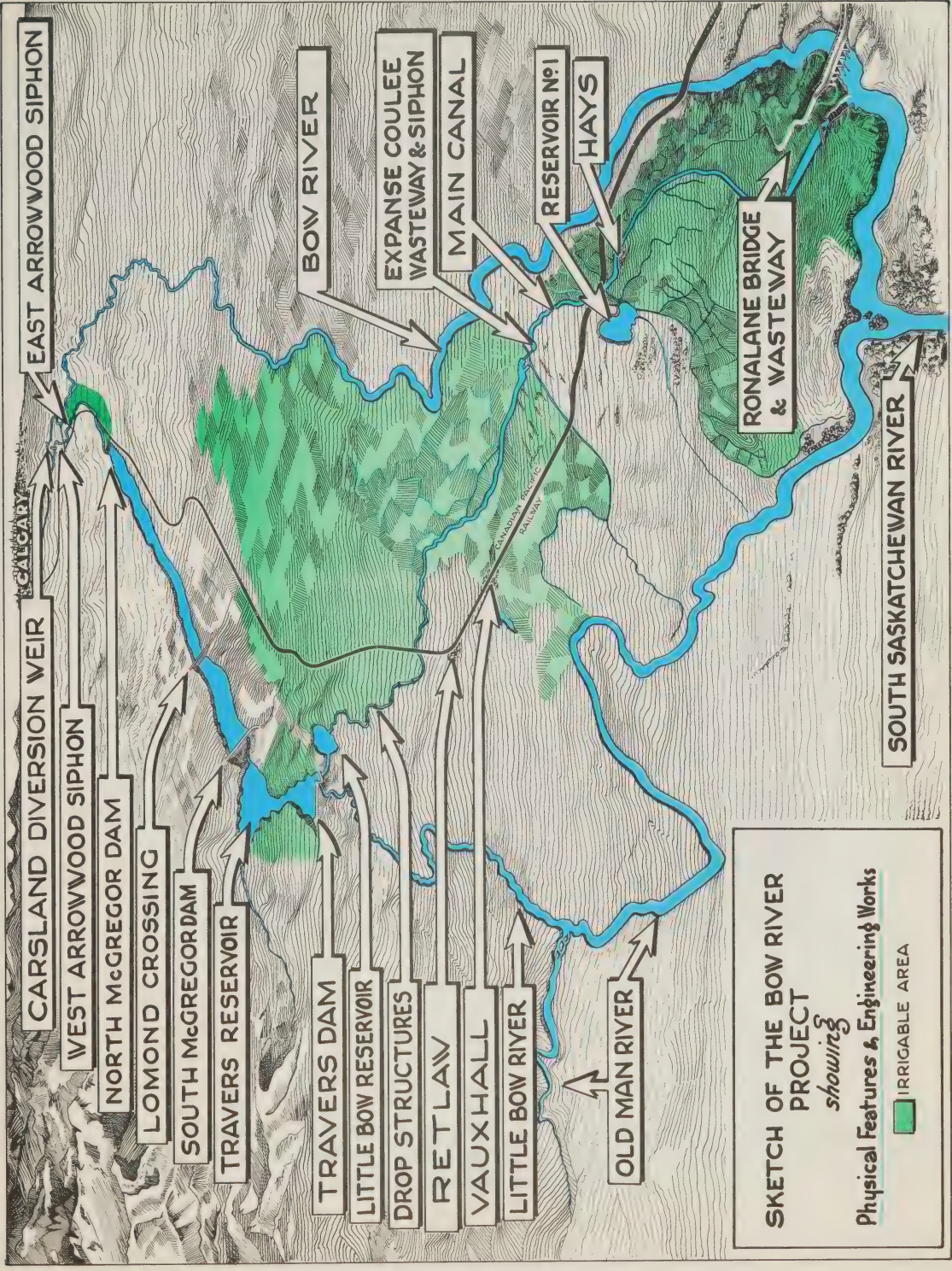


Renovating the control structure of the South Dam of Lake McGregor. This concrete was originally placed over forty years ago.

Ref. # 14714

Project maintenance crews built 258 other small structures, renewed Laterals "A" and "J", built 6 chute-type drops on Drain 4 and enlarged and cleaned out Lateral "B". A total of 25,760 lineal feet of canal was strengthened and 163,510 lineal feet were cleaned by dragline.

The construction of Highway #36 necessitated the moving of 500 feet of canal and associated structures. The renovation of canals and structures on the Blackfoot Indian Reserve was completed in 1957.







## Operation and Irrigation

Although not reflected in the crops produced, 1957 was a year of severe drouth in the Vauxhall and Hays irrigation districts of the Bow River Project. The average annual rainfall for these areas was just below 12 inches. In recent years rainfall has frequently been well above average. In 1957 the total rainfall was less than 9 inches with only 5 to 6 inches of rainfall during the growing season. The soil moisture reserve from 1956 proved an asset in the established areas but in the newer areas at Hays, irrigation was necessary to germinate the crops.

The first farm deliveries of water were made on May 17th which was earlier than is usual. A steady increase in the demand for water continued to July 16th. when 1200 c.f.s. were being used. Deliveries totalled 48,043 acre feet to 461 units in the Vauxhall area and 30,114 acre feet to 171 units in the Hays area, or a total of 78,157 acre feet delivered to 634 units as compared to the total deliveries of 53,512 in 1956 and 43,901 acre feet in 1955.



Irrigation pattern in the Hays district of the Bow River Irrigation Project showing the main canal, settlers' homes, and the town of Hays.

Ref. # 13964

Water was delivered for the first time in 1957 to the West Block of the Bow River Project, a district which is being developed by the Province of Alberta. A total of 3073 acre feet of water was received by this area during 1957.



The natural flow into both Lake McGregor and Travers Reservoir was low. Of the 157,359 acre feet diverted from the Bow River into Lake McGregor, 137,208 acre feet were passed to the Travers Reservoir. In 1956 the lower part of Lake McGregor was dewatered to make repairs and to renovate the South Dam. It is expected to fill the part of Lake McGregor below Lomond Crossing in the spring of 1958.

### Drainage

The program of drainage improvement on the project was continued during 1957. In addition to the 1025 feet of tile drain which were put in to connect two existing tile drains in the pasture north of Vauxhall, 113,400 feet of new shallow surface drains were constructed and 123 structures such as road culverts were installed. Four thousand five hundred feet of old drain was cleaned using a dragline with a clamshell bucket. To measure the return drainage flow to the river, 4 gauging stations were put in during 1957.

### Resettlement

The resettlement of farmers from sub-marginal prairie farms continued through 1957. Twenty settlers were located on irrigated farm units in the Hays area. There are still about 15 parcels to settle.

To assist settlers to become established, 7500 bushels of seed grain were distributed on the basis of 2 bushels of threshed grain for each bushel of seed supplied, and 8450 pounds of forage seed were distributed at cost. For more details of resettlement refer to the Bow River Resettlement Program found on page 27 of this report.

### Pastures

To improve the water supply in the pastures east of Hays, the dugouts were fenced and six windmills were erected during the year to pump water from the dugouts into stock-watering troughs.

A new 3200 acre pasture south of Hays was fenced to retain sheep. Five hundred and thirty-eight acres have been broken and worked down for seeding to tame pasture. This area will provide irrigated pasture for farmers in the Hays district.

### Agricultural Development

In co-operation with the Experimental Farms Service, work is being carried on to evaluate time and cost of bringing heavily levelled land back to peak production. Work to determine best use of the lighter soils was carried out on the Windmill Flats and the water requirements of this soil were studied by the Drainage Division. The growing of forage seed plots is being discontinued as the farmers are starting to produce their own seed.

Specialty crops including potatoes, turnips, tomatoes and peas are beginning to play a more important role on this project. Livestock feeding is also increasing throughout the area. The livestock market has been good and a large number of cattle and hogs are marketed each year from the project area. Year around feeding is becoming a common practice and this provides a more even income for the farmers.



Sheep grazing in the new irrigated pasture south of Hays, Alberta.

Ref. # 13722

Weed control was carried out on an extended scale and indications are that this program is achieving success. Canal banks and roadsides were sprayed during the summer. The practice of levelling canal banks and seeding them to Crested Wheat Grass was continued. Some 70,000 pounds of Crested Wheat Grass seed were harvested from roadsides, canal banks and two plots.

#### Economic Conditions

General economic conditions remained unchanged during 1957-58. Although the prices for farm products did not keep pace with the increased cost of production, livestock prices held steady, with the result that farmers with livestock did reasonably well. Grain yields throughout the area were fair and hay yields generally good. Yearly improvements indicate that success will be attained by the good farmers on this project.

## SASKATCHEWAN RIVER RECLAMATION PROJECT

Since 1950, P.F.R.A. has been engaged in an investigation to determine the feasibility of reclaiming portions of the Saskatchewan River delta, west of The Pas, Manitoba. It is estimated that this area contains about one million acres of potentially arable land. Actual development of the Pasquia Area, which is located between the Carrot and Pasquia Rivers southeast of The Pas, began in 1953. This area, containing 135,000 acres, is expected to yield approximately 100,000 acres of arable land. The experience gained in reclaiming the Pasquia Area will be a valuable guide if, in the future, it should be decided to develop the remainder of the delta region which is known generally as the Sipanok Area.

### Sipanok Area

A topographic survey program of the Sipanok Area laid out in 1954 was completed in 1957. In addition, hydrometric surveys pertaining to the discharge of sediment and water into and through the Saskatchewan River delta were continued during the summer months. A new sediment discharge metering station was established about 35 miles above the Sipanok Channel, at Nipawin, Sask. Besides providing information essential to the formulation of engineering plans for possible reclamation work in the Sipanok Area, the surveys also provide information which is useful in the operation of the Pasquia Project.

### Pasquia Area

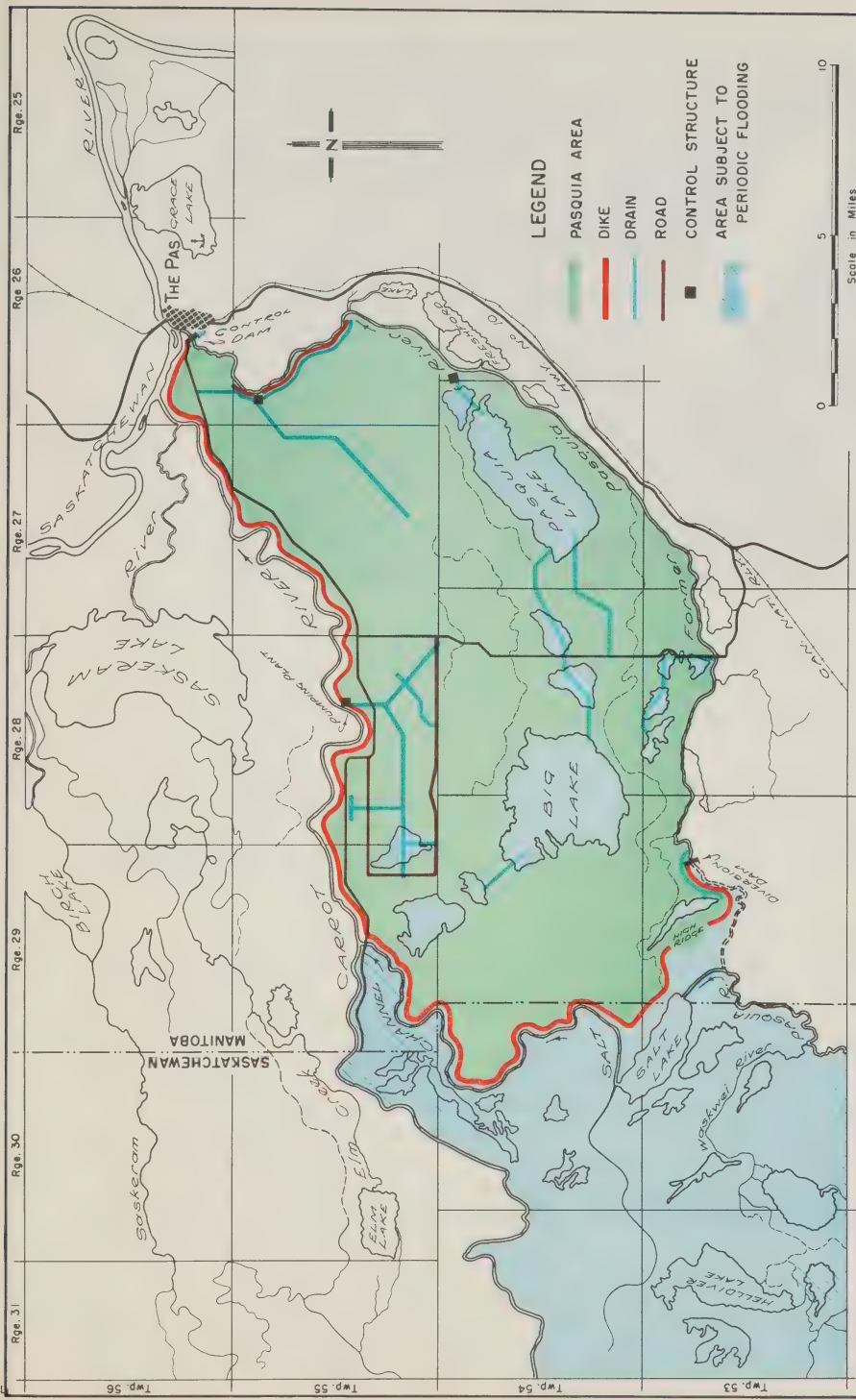
#### Surveys

For the continued development of the Pasquia Area, surveys were made during 1957-58 to establish lines and grades for the construction of drains, roads, dykes and control structures. Center lines, levels and slope stakes were established for approximately 22 miles of drain and 13 miles of road.

#### Operation

The operations on this project were concerned principally with the disposing of surplus water. Between June 11, 1957 and freeze-up, some 25,000 acre feet of water were drained from the Pasquia Project into the Saskatchewan River by way of the Control Dam on the former Pasquia River. In future years, Big Lake will also be drained through the Control Dam as the necessary drainage ditches to permit this operation were completed in 1957.

To prevent extensive flooding of cultivated land in Tp. 55, Rge. 28, and to facilitate the construction of drains in this area, the permanent pump installed at Mile 14 in 1956, was kept in operation during May and June, discharging the runoff water into the Carrot River.



DEPARTMENT OF AGRICULTURE - CANADA  
P.F.A.

SASKATCHEWAN RIVER  
RECLAMATION PROJECT

# PASQUIA AREA

MARCH 31, 1958







Junction of Carrot River and drainage Ditch K showing the relative location of Mile 14 pumphouse.

Ref. # 14509

### Field Investigation

In addition to the seventeen water gauges installed in the Pasquia Area during 1957-58, to collect data on the behaviour of streams and lake elevations, a small meteorological station was established near the center of the project to gather information on rain intensity, maximum and minimum temperatures, and evaporation.

From May 1957 to October 31, 1957 total precipitation was 11.42 inches as compared with a 44-year average for this period of 11.87 inches. The frost-free period in 1957 was 108 days, in 1956 one hundred and twelve days and the long-term average frost-free period is 110 days.

### Construction

A few widely separated drains not suitable to let under contract, were constructed by P.F.R.A. using rented equipment. Five drains were completed and five culverts were installed during 1957. The final three miles of the Carrot River dyke right-of-way, together with about 7 miles of drainage ditch spoilbanks were made ready for cultivation or for seeding to forage crops. A total of six miles of dyke and berm were seeded during 1957.

Approximately 1,700 cubic yards of gravel were placed at various points along dykes to prevent wave erosion, and at the Mile 14 pumping plant 40 cubic yards of rock were used as bank protection. Following the first year's operation it was found necessary

to make certain additions and alterations to the Mile 14 pumping station to improve its operation. To alleviate flooding at Mile 14, a dyke was constructed during 1957 on a small creek which contributes to spring flooding of that area.

The campsite shelterbelt planted in 1956 was improved by replacing the dead willows and by planting an additional 300 spruce trees. The campsite area was sown to grass in the spring of 1957 and additional landscaping is planned for 1958.

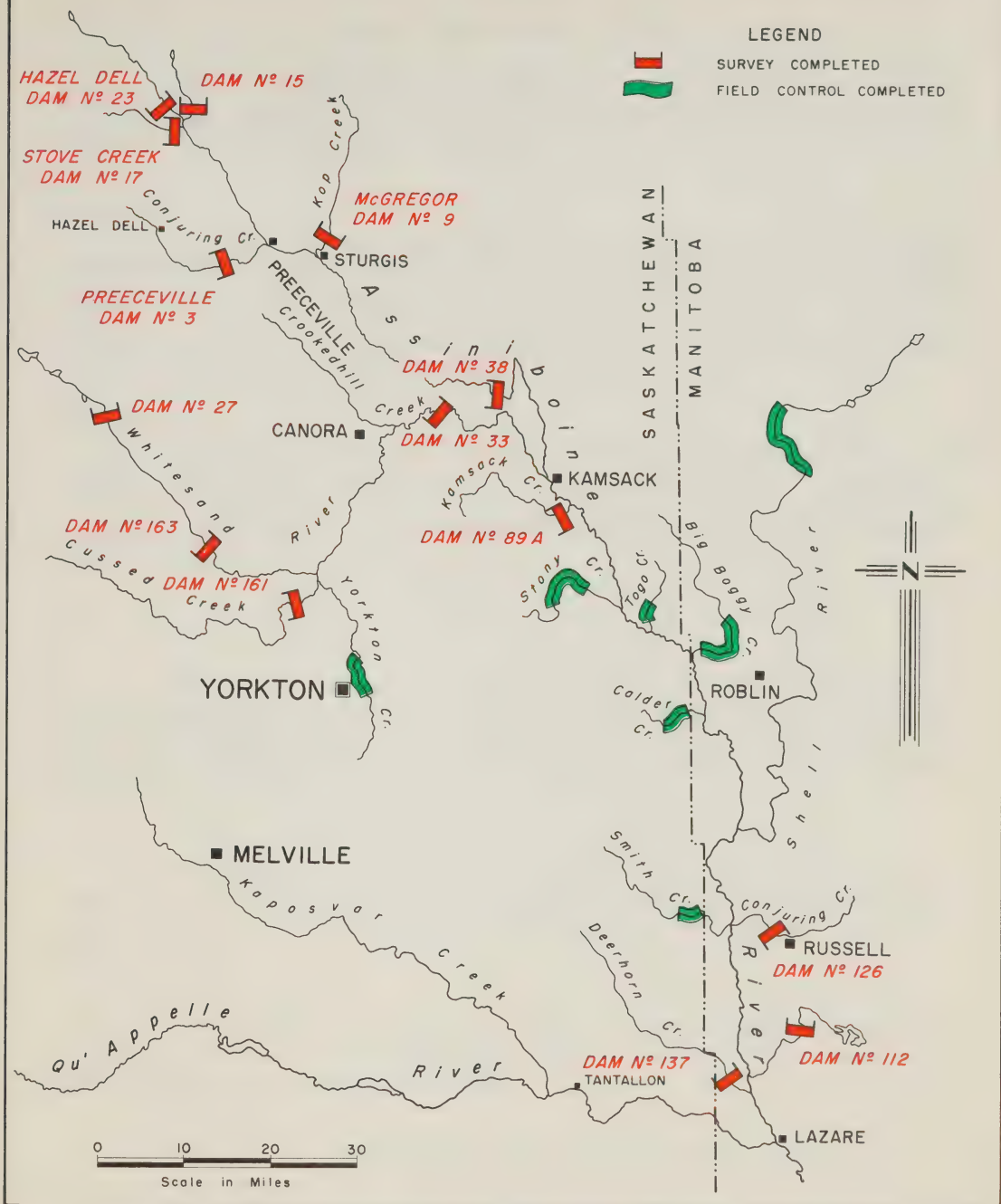


Mile 14 pumphouse and operator's cabin showing the water level in October 1957.

Ref. # 14547

### ASSINIBOINE RIVER PROJECT

In 1950 the responsibility for flood control along the Assiniboine River between Portage la Prairie and Headingly, Manitoba, was transferred from the Federal Department of Public Works to the Department of Agriculture. Since that time P.F.R.A. has carried out a flood control program comprised of dyking and river cut-offs to protect the farmlands in that area from flooding during periods of high flow in the river. In recent years extensive surveys have been undertaken in the Upper Assiniboine River watershed, in order to locate storage sites for more effective stream regulation in the Lower Assiniboine. For the purpose of this report, the Upper Assiniboine includes the reaches upstream from the City of Brandon, while the Lower Assiniboine extends from Brandon to Winnipeg.



DEPARTMENT OF AGRICULTURE - CANADA  
P. F. R. A.

PLATE VIII

# UPPER ASSINIBOINE RIVER PROJECT PROPOSED DAMSITE LOCATIONS

MARCH 31, 1958





## Upper Assiniboine River

The Assiniboine River rises in the Porcupine Forest Reserve in northeastern Saskatchewan. During 1956-57, P.F.R.A. began a program of surveys and investigations for the purpose of developing reservoirs in the upper watershed for water conservation and flood control.

### Surveys

Following extensive surveys, out of 29 reservoir locations, 6 sites were chosen for more detailed investigations. These investigations were completed during 1957-58. Surveys were completed and plans were drawn of additional sites on the Whitesand River, Cussed Creek and Kamsack Creek. Surveys for damsites on the Upper Assiniboine and its tributaries in Saskatchewan, are nearly completed. In Manitoba, sites for dams have been surveyed on the Shell River, Conjuring Creek, Silver Creek and Deerhorn Creek.

### Construction

Some dyke repair work was done in the Kamsack area, a short section of new dyke was constructed, and three small breaks in the existing dyke were repaired. Five miles of the Miniota dyke, which was erected in 1956, were trimmed. The farmers who own the protected land, cultivated and seeded the dykes to grass following the completion of the trimming. The grass seed was supplied by P.F.R.A.

## Lower Assiniboine River

The Assiniboine River dyke system between Portage la Prairie and St. Francois Xavier is now in good condition. Only one or two gaps remain where difficulty has been experienced in acquiring the necessary dyke right-of-way. To date, about 62 miles of new dyke, four river cutoffs and several miles of dyke maintenance and repair work have been completed.

### Surveys

During 1957-58, the major part of the survey work was in connection with the construction and maintenance of dykes. Some topographic detail was obtained for the design of Peterson's cut-off, which is the fourth proposed river cut-off between Poplar Point and Bail St. Paul.

### Construction

During 1957-58, 14.3 miles of new dykes were constructed and repair and maintenance work was done on over 4 miles of dyke. Five culverts were installed and approximately 12 miles of dyke were seeded to grass.

## NORTH WEST ESCARPMENT AND INTERLAKE RECLAMATION

The North West Escarpment and Interlake Reclamation Areas include the streams and rivers flowing off the northern and eastern slopes of the Riding, Duck and Porcupine Mountains; the Whitemud River Watershed; and the Interlake district between Lakes Winnipeg

and Manitoba. The Government of Manitoba, has asked Canada, through P.F.R.A., to carry out a program of investigations and construction to relieve flood and erosion problems in that area, containing over 252,000 acres of valuable agricultural land.

## Riding, Duck and Porcupine Mountains

### Survey

As a result of erosion along Edwards Creek, there has been a build-up of silt where Edwards Creek enters Lake Dauphin. This condition could affect the recreational value of Dauphin Beach. Surveys of the lake bottom, in the vicinity of the Beach, were carried out in 1957.



Aerial view of silt deposit in Dauphin Lake at the outlet of Edwards Creek ditch.

Ref. # 14492

Additional surveys were undertaken to determine the feasibility of relocating the entrance of Edwards Creek into Lake Dauphin, and to determine the amount of scour that has taken place in the ditch. Other surveys were undertaken to study flood control problems on the Fork and North Pine Rivers, to locate an access road into the headwaters of Wilson Creek, and to obtain detailed topographic information in regard to a proposed stream gauging station site on Wilson Creek.

### Construction

Projects involving both new work and repairs to older systems in the Riding Mountain Area were completed during 1957-58. The improvements made on Edwards Creek

Mink Creek, Wilson River and Mineral Creek included bank protection, channel clearing, dyking, and the construction of a number of bridges. Apart from works designed and supervised by the P.F.R.A., several other projects, financed jointly by the Federal and Provincial Governments, were undertaken in the Duck and Porcupine Mountains. These latter jobs required periodic inspection by P.F.R.A. personnel, but were supervised in the field by employees of the Province of Manitoba.

## Whitemud River Watershed

### Surveys

During 1957 surveys were carried out in connection with the proposed Neepawa Dam on a seven mile reach of the Big Grass Drain along the east boundary of Westbourne Community Pasture, in the flood-prone area of Beaver Creek, and on the proposed Whitemud River Diversion.

### Construction

Work, other than surveys, done in the Whitemud River Watershed consisted of clearing scrub and trees from a 50 mile reach of the Whitemud River channel. This work, the purpose of which was to increase the discharge capacity of the channel, was financed jointly by the Municipal, Provincial and Federal Governments.

## Interlake Reclamation Project

### Surveys

A survey was undertaken in the Swan Creek-Burnt Lake area of the Interlake region of Manitoba. The object of this survey was to design a means of maintaining the water levels in the lakes and sloughs in the area and to lay out a drainage system to carry flood waters to Lake Manitoba.

## SOUTH SASKATCHEWAN RIVER DEVELOPMENT

The present proposal is to develop the waters of the South Saskatchewan River by constructing an earth dam midway between the Towns of Outlook and Elbow. Located in central Saskatchewan, this dam would provide water for irrigation, a site for electric power, stream flow regulation and flood control, urban water supply, recreational facilities, and water for other industrial and domestic uses. Survey work on the South Saskatchewan River to determine the feasibility of this development commenced in 1943 and from an engineering standpoint, this has now been established. Sufficient information has now been gathered to proceed with construction should it be decided to develop this project.

### Engineering Investigations

During 1957-58 the main work undertaken on the South Saskatchewan River was the continuation of an extensive drilling investigation of site foundations. Silt-sampling and stream flow measurements were continued at Outlook on the South Saskatchewan River, and at Borden on the North Saskatchewan River. Survey work undertaken during the season consisted of bore-hole survey ties, and the running of 24 miles of preliminary survey line for a high-line canal as a possible extension to the project.



### Pre-development Farm

Near the town of Outlook in Saskatchewan, the Federal Government has established a 171 acre pre-development irrigation and experimental farm to study irrigation techniques and practices under the soil and climatic conditions prevailing in that area. Water for irrigation is obtained by pumping from the South Saskatchewan River.

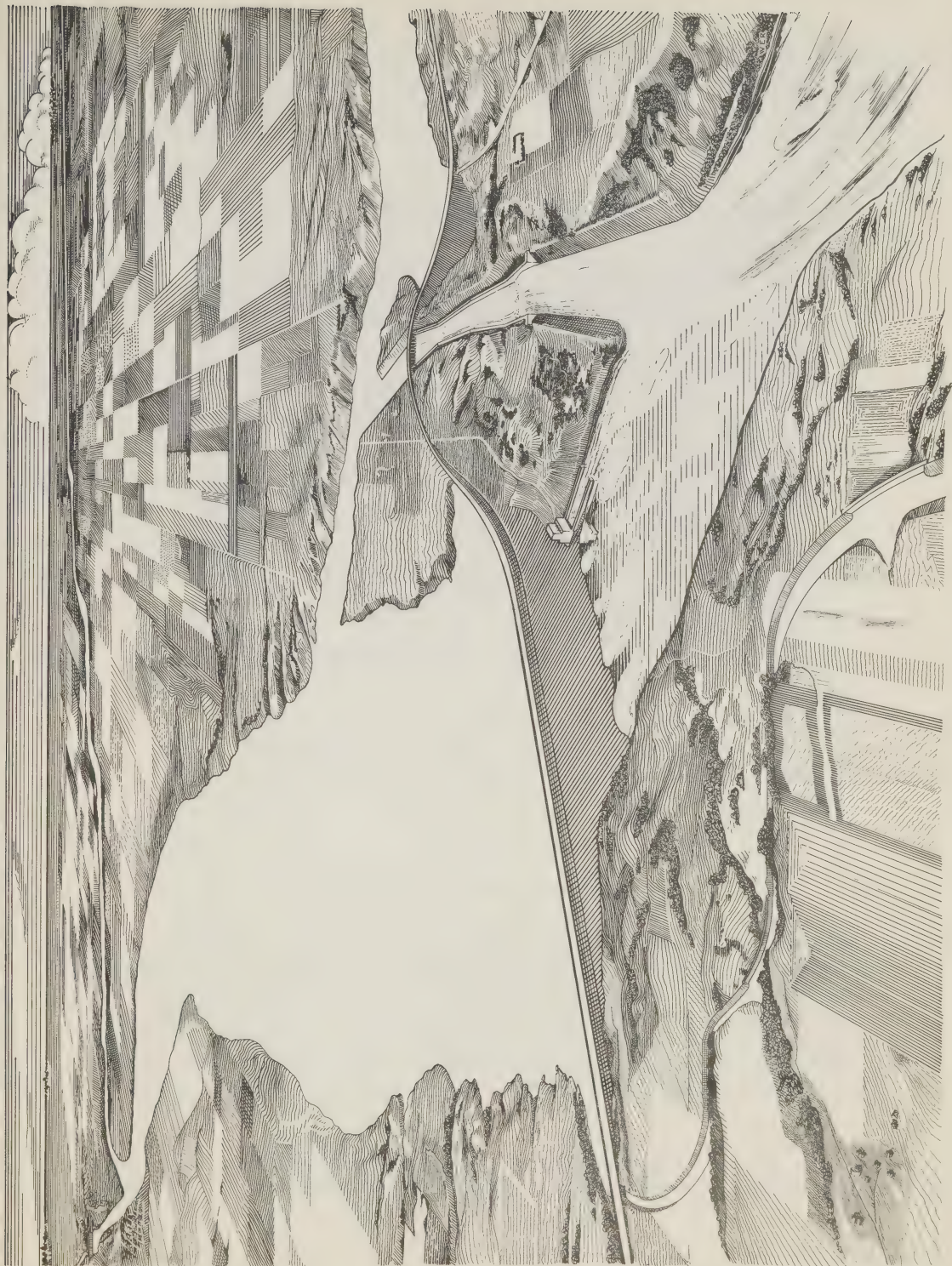
The area is divided into two parts. One part, approximately 16 acres in size, is operated by the Experimental Farms Service where detailed experimental work is conducted on irrigated crops and soils. The other part of the farm, 155 acres in size, is operated by the P.F.R.A. to demonstrate on a field scale, farming practices and irrigation methods recommended for the area. The P.F.R.A. follows a carefully planned soil improvement program on the farm, using a ten year grain-grass rotation, plus commercial fertilizers, manure, and legumes which has resulted in a steady improvement in crop yields over the years since the program was first started.



Farmstead and dugout of the Pre-development Farm at Outlook, Saskatchewan, with the South Saskatchewan River and railway bridge at the top of the picture.

Ref. # 11580

During the pumping season, May 7th. to September 23rd, an average of 15 inches of water was used which is an increase of 3 inches over the amount used in 1956. Rainfall during the same period was 6.2 inches, about one inch less than the previous year.







In addition to the experimental field work 96 yearling bulls were wintered on the farm during 1956-57 and remained there on pasture until mid-summer when 54 were taken to the Community Pasture north of Maple Creek. The remaining 42 bulls were pastured until fall then wintered in 1957-58 on feed produced on the farm during the 1957 season.



Irrigated potatoes on the Pre-development Farm at Outlook, Saskatchewan. Baled hay in the adjoining field is also a part of the farm's pre-development program.

Ref. # 2988

### BUFFALO POUND LAKE PROJECT

Buffalo Pound Lake, located in the upper Qu'Appelle Valley about 20 miles north of the City of Moose Jaw, has been developed into a water storage reservoir principally to supply water for the Cities of Regina and Moose Jaw. This development was undertaken by P.F.R.A. at the request of the Federal Government. By an agreement with the Province of Saskatchewan, the Government of Canada has accepted the responsibility for maintaining the water level of the Buffalo Pound Lake. Because of its location, the Buffalo Pound Lake Reservoir is an integral part of the over-all plan for the South Saskatchewan River Development.

At present the Buffalo Pound Lake Project consists of works capable of pumping 120 c.f.s. of water from the South Saskatchewan River at Elbow, a vertical distance of



107 feet, and delivering it 12 miles away at the summit of the Qu'Appelle Valley. Construction work on the intake from the South Saskatchewan River and the two pumping plants was 90% completed by March 31, 1958. The second part of this project was to improve the flow characteristics of the Qu'Appelle River between the summit of the Qu'Appelle Valley and Buffalo Pound Lake. This was accomplished through an extensive channel improvement program started in 1955 and completed in 1957.

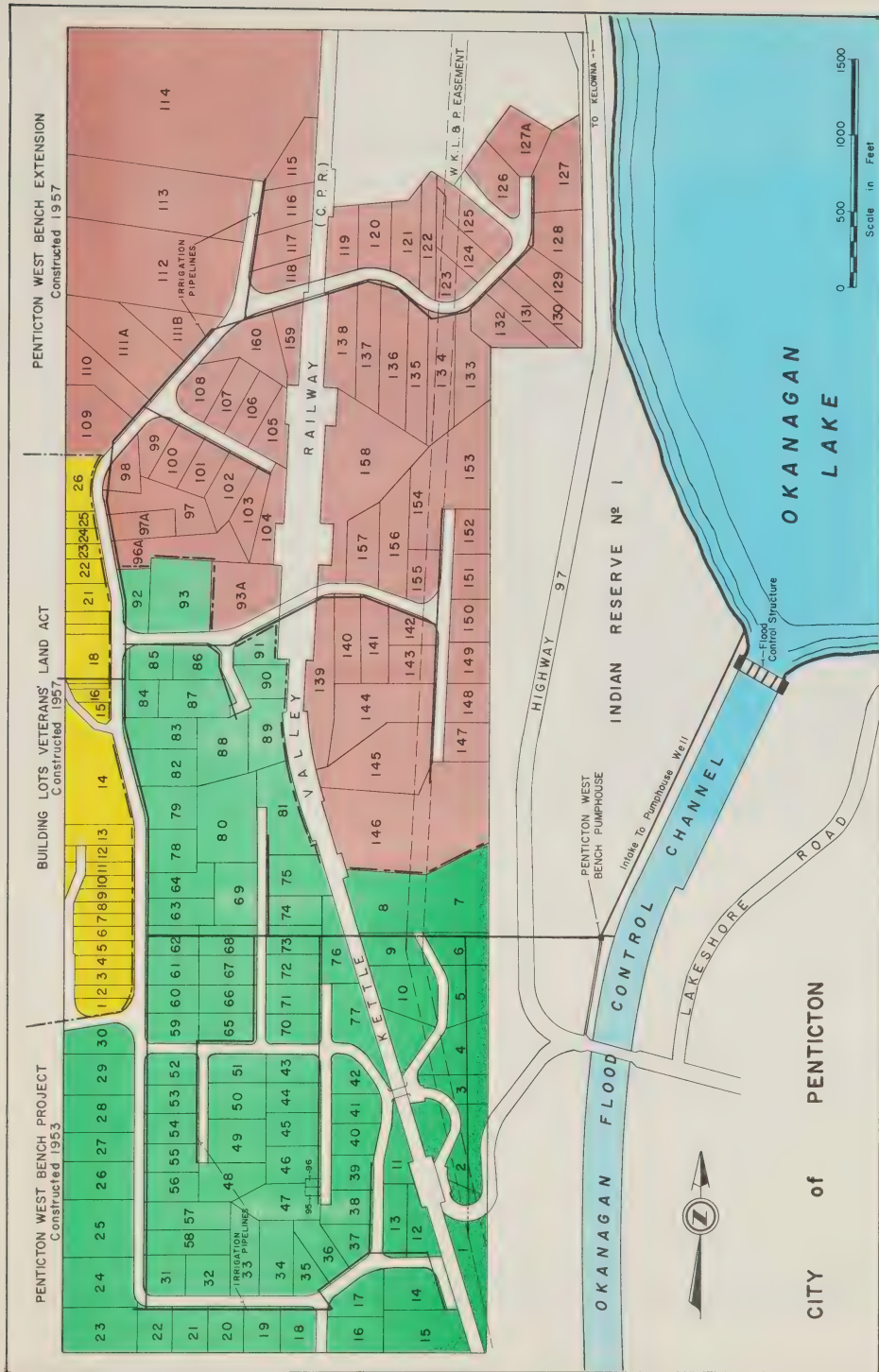


Pumping Station No.2 located about three miles from the No.1 pumping station which is on the bank of the Saskatchewan River. The No. 2 station pumps water almost ten miles to the summit of the Qu'Appelle Valley.

Ref. # 15863

#### BRITISH COLUMBIA PROJECTS

The activities of the Prairie Farm Rehabilitation Administration in the Province of British Columbia during 1957-58 were confined to the completion of project work started in 1956-57, a limited amount of project improvement work, and some investigational work for the Department of Indian Affairs, the Government of British Columbia, and the Veterans' Land Act Administration.



DEPARTMENT OF AGRICULTURE—CANADA

**PENTICTON WEST BENCH IRRIGATION PROJECT**

BRITISH COLUMBIA

MARCH 31, 1958

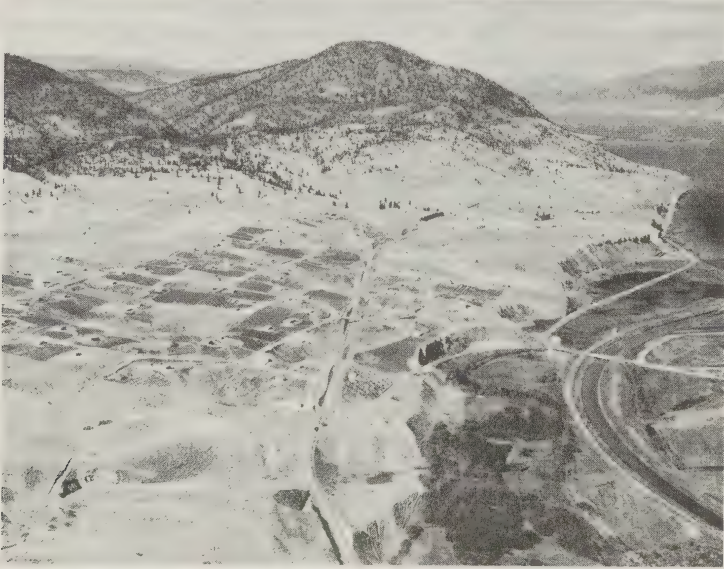
CITY of PENTICTON



## Project Construction

### Penticton West Bench Extension

The Penticton West Bench Project, consisting of 204 acres divided into 94 small holdings, was completed in 1954 and all holdings were allotted by 1956. As a result of Veteran demand, an extension to the initial project was undertaken to provide an additional 69 small holdings and some 25 buildings and business sites. Construction of the irrigation system for this extension was started in March 1957 and completed in June 1957.



Penticton West Bench project with the extension area shown at the upper end of the present development, confined by the secondary toe of the mountain slope and the edge of bench above the lake.

Ref. # 13334

Water for domestic and irrigation use will be supplied from the Okanagan River by a new 150 H.P. pump installed in the present West Bench pumphouse. Many of these lots have already been allotted and housing construction has been in progress since July 1957.

## Project Operation

### Westbank Project

This project, completed in 1951, is situated on 1100 acres of bench land across the Okanagan Lake from Kelowna and is divided into 72 full time farms and 53 small holding units.



Cathodic protection was applied to this system in 1955 to protect the steel pipe line from electrolytic corrosion which occurred in scattered locations. Further corrosion was experienced in one location during 1957. This was remedied by applying higher protective voltage in that area.

## Project Investigation

### Lower Cowichan River Reclamation Project

Surveys and investigations of the lower Cowichan and Koksilah Rivers were undertaken in the summer months of 1957, at the request of the Department of Indian Affairs for the purpose of preparing a reclamation report having particular reference to the Cowichan Indian Reserve. A report on reclamation and its probable benefits to this Reserve was completed in 1957-58.

### Lillooet River Reclamation Project

This dyking and drainage development which was completed in 1951, is located in the Lillooet Valley near Pemberton, British Columbia. Some 14,000 acres of fertile agricultural land were reclaimed or protected from future flooding by the project. In view of the need of the Pacific Great Eastern Railway to replace their bridge on the Lillooet River Crossing and their willingness to change its location, the district requested some further remedial works on the river. A field reconnaissance and preliminary report of remedial work proposed and its probable benefits has been prepared on this aspect.

### Cawston Benches

This V.L.A. Irrigation project, situated on the Similkameen River benchlands, three miles from Keremeos, was completed in 1951 and consists of 624 acres subdivided into 52 full time farms.

Because of the silt pollution of the river water, and the undesirable features of the chlorinated water for domestic use, particularly in the winter time, the district has requested an investigation of the groundwater resources in that area. In December of 1957 a field examination of these sources was made by the Soil Mechanics Branch of the P.F.R.A.

## ENGINEERING SERVICES

For many of its projects P.F.R.A. requires basic information, much of which involves highly specialized knowledge and training. To supply this information, which is seldom available from outside sources, the organization has set up a number of Divisions under the general heading of Engineering Services.

### HYDROLOGY DIVISION

This Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P.F.R.A. projects. In addition, the Hydrology Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies. It also provides information for the Canadian section of certain international engineering boards established under the International Joint Commission.

The work of the Hydrology Division falls into three categories: water supply and water utilization studies for individual projects, flood potential studies for individual projects, and comprehensive studies on a watershed basis.

#### Watershed Studies

The purpose of studies on a general watershed basis is to present an over-all picture of future water supply and utilization in selected drainage basins. The following reports on the Qu'Appelle Valley Watershed were completed in 1957-58: -

- Hydrology Report #17 - Folio of Information on development in the Qu'Appelle Valley (March 1958)
- Hydrology Report #19 - Uses of water in the Qu'Appelle Watershed (March 1957)
- Hydrology Report #20 - A flood damage yardstick for the Qu'Appelle Valley (June 1957)
- Hydrology Report #21 - Floods and flooding problems in the Qu'Appelle Valley (March 1958)
- Hydrology Report #22 - Water supply and use in the Qu'Appelle Watershed (March 1958)

Watershed studies are now underway in the Pipestone Creek-Oak Lake Area, and the Upper Assiniboine River basin. The latter is being carried out in conjunction with the regional staff at Winnipeg, Manitoba. When complete, the findings will form a portion of a general P.F.R.A. report on water development possibilities on the Upper Assiniboine.

## Individual Project Studies

During the year flood frequency surveys were conducted on the Frenchman River at West Val Marie Dam, the Cowichan and Koksilah Rivers near Duncan, B.C., and on the Wiwa Creek at Braddock, Sask. Flood frequency and water supply surveys were made on Creeks at Rosthern and Grenfell and on the West Branch of Poplar River. Water supply surveys were conducted on ten individual projects in Saskatchewan and Manitoba.

## Miscellaneous

Basic work was done in 1957-58 to adapt general flood frequency analysis to prairie conditions. The object was to select suitable procedures for processing flood data for use in a study of floods in the whole prairie area. A review of the surface water possibilities at all large urban centres in the Assiniboine, Souris and Qu'Appelle basins was undertaken during the year. As in past years, the preparation of drainage maps from aerial photographs has been continued. These maps provide a ready source of drainage area information for any stream of the prairies. Other work included snow surveys for the Upper and Lower Qu'Appelle River areas made in co-operation with the Manitoba Water Resources Branch, stream flow measurements at Davin and in the Carrot River basin, and the establishing of gauges to assist in operating Dellwood Brook diversion.

As Secretariat of the Prairie Provinces Water board, preliminary work has been done to establish the frequency and the amount of runoff at any point on the prairies.

## SOIL MECHANICS AND MATERIALS DIVISION

The Soil Mechanics and Materials Division is responsible for providing technical advice on the design and maintenance of earth dams, the foundation design of structures, and the use of soils, concrete and other materials for construction purposes. To carry on these functions the Division must make detailed investigations of damsites and foundations, conduct exhaustive laboratory tests, analyse data and make appropriate design studies. For these projects under construction, control testing of soils, cement, and concrete is required, and special test apparatus must often be installed to measure the performance of dams, spillways and conduits. Performance records are kept and special studies are made to provide a guide for the improvement of design and construction procedures.

Exploratory drilling is usually the first step in investigating a new project. This provides a knowledge of the foundation soils and the availability of borrow material and concrete aggregates, and the samples of soil needed for laboratory tests. During 1957 more than 55,000 ft. of drilling was done and over 10,000 soil samples were obtained by drills operated by the Division. While much of the drilling is of a routine nature, some of it requires specialized equipment and knowledge as was the case in obtaining large samples or "cores" of the bedrock at the Waterton Damsite so that details of fracturing and stratification of the rock could be easily observed.

Except for small field laboratories located at dams under construction, all soil, cement and concrete testing is done at the main laboratory in Saskatoon. The soil testing



portion of this laboratory was moved into the new Agriculture Research Laboratory at Saskatoon in August 1957.

When testing has been completed the results are analyzed. A description of the test results obtained, the various studies made, and the conclusions reached, are usually recorded in the form of a formal report, copies of which are sent to the Chief Engineer, Design Division, and appropriate Project offices. The following damsites were investigated and reported upon in the past year: Waterton, Rivers, Cromer, Damsites in Upper Assiniboine Valley, Cypress Coulee, Dead Horse Coulee, Bluefield, Black Eagle, Seine River Diversion, Neepawa, Mary-Jane Creek, and Antler River. Various other damsites still under investigation are South Saskatchewan River Sites 8 and 10, Sounding Creek, Red Deer and Antelope Syphon.



One of the drills operated by Soil Mechanics and Materials Division being used to obtain 36 inch diameter samples of bedrock at the Waterton Damsite.

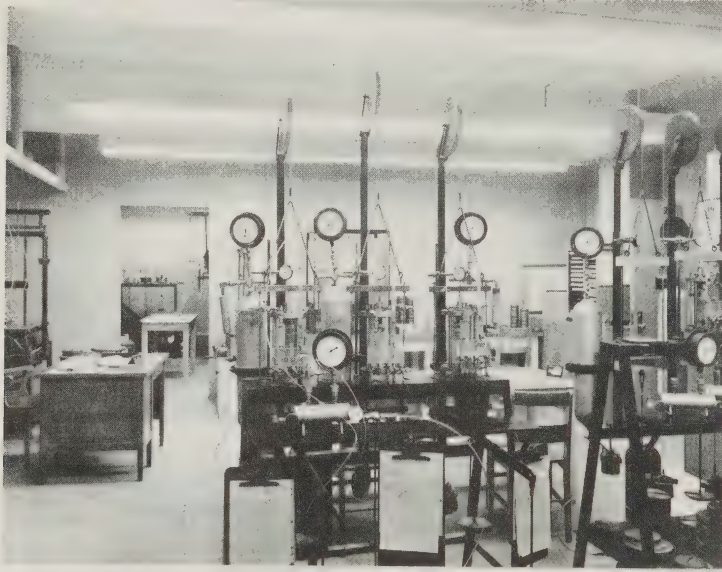
Ref. # 15058

During the year the following projects were provided with field testing and control pertaining to soils and concrete: Boundary Dam, Belly River Weir, Lafleche Dam, Rock Lake Dam, Canal - Belly River to St. Mary Reservoir, East Ridge Dam, Jensen Reservoir Spillway, Larsen Dam, and Morden Spillway. Field inspections with some investigations and advice was provided for a number of smaller projects.

Some work was also done for other government departments involving found-



ation investigations for proposed structure sites. Work was also continued on a number of practical research problems such as swelling clay-shales, canal lining materials, western concrete aggregates, flexible metal conduits, winter concreting and structures on highly plastic clay. A new research project dealing with the frost heaving of structures was begun during the year. As in the past, the results of studies on research problems have also been made available to other departments and interested people by means of direct discussions, correspondence, and the publishing of reports and technical papers.



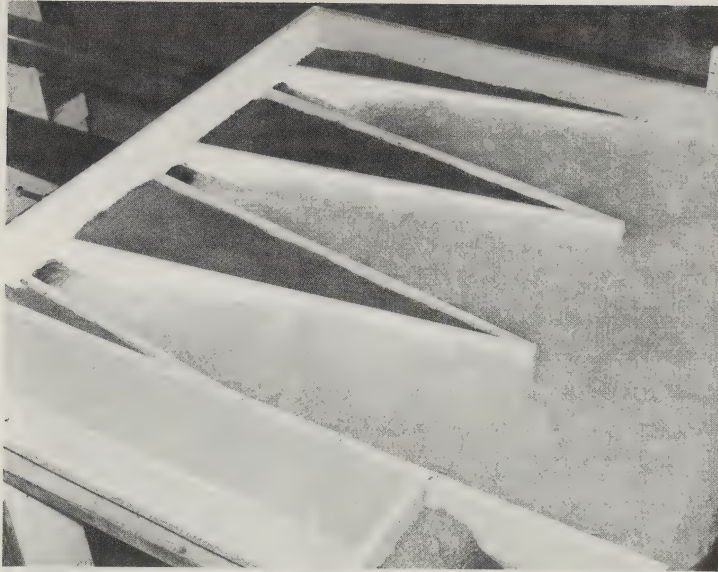
A portion of the new Soil Mechanics Laboratory in Saskatoon showing apparatus used for measuring the shear strength of soil samples.

Ref. # 15057

## DESIGN DIVISION

The Design Division is responsible for all major engineering, planning and design work for all P.F.R.A. divisions and services. Certain engineering components of projects are done by other divisions giving engineering services, and this information is used by the Design Division in its own work, or integrated as supplied, into the completed design.

The engineering success of water-carrying structures is heavily dependent upon information gathered in regard to the hydraulic behaviour of structures obtained from scale model testing under actual flow conditions. For this purpose, the Design Division operates a modest but well equipped hydraulic laboratory in Regina.



Model test of the Outlet structure for the South Saskatchewan River Diversion Tunnel.

Ref. # 15875

The major engineering design work done during 1957-58 included projects designed with construction in progress or completed, and design work on projects and structures to determine engineering and economic feasibility. Design work was done for 12 projects under construction during the year and complete design plans were prepared on 6 projects not yet constructed. Design engineering services were also provided for 12 other P.F.R.A. projects.

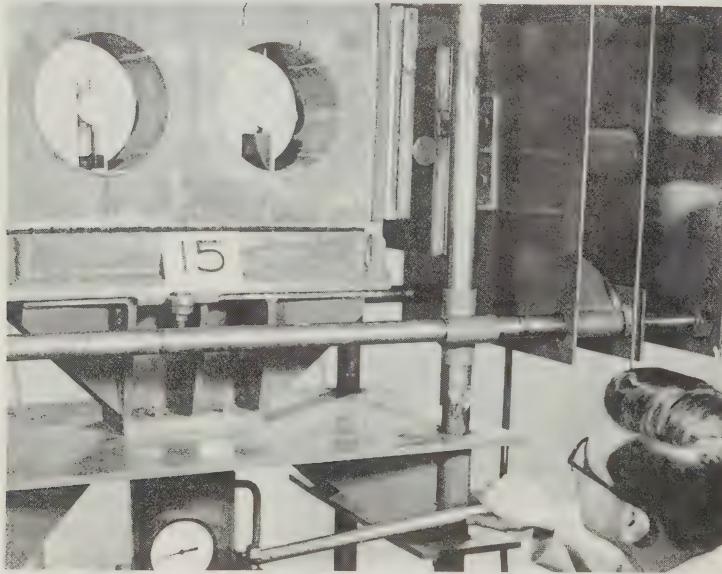
The Design Division prepared drawings of standard dwellings for Community Pastures, plans of facilities for handling livestock, and a considerable number of pasture maps.

The Division also designed and supervised the construction of a large steel and brick P.F.R.A. warehouse in Regina which was completed in 1957.

Design engineering services were continued in 1957 on contracts awarded by the Alberta Government for the Bow River Project. In Saskatchewan, reappraisal work was carried out on the South Saskatchewan project in collaboration with engineers of the Saskatchewan Power Corporation. A considerable amount of design work and engineering studies were undertaken on the headwaters of the Upper Assiniboine River system, with complete designs being prepared for the Stove Creek Dam and Preeceville Dam, and the preliminary engineering work being completed for the Hazel Dell Dam and the McGregor Dam.

Standard drawings of designs of a recurring nature were maintained as in previous years. The ozalid printing service was made use of by all divisions of P.F.R.A. and during the year approximately 155,000 square feet of prints were produced.

The Hydraulics laboratory constructed scale models of a portion of the South Saskatchewan River project, a model of the Crawling Valley Outlet, and continued model studies of wall heights for level and sloping stilling basins. Studies were started on culvert inlets. A model test of the South Saskatchewan River tunnel outlet stilling basin was conducted to determine design requirements of this structure.



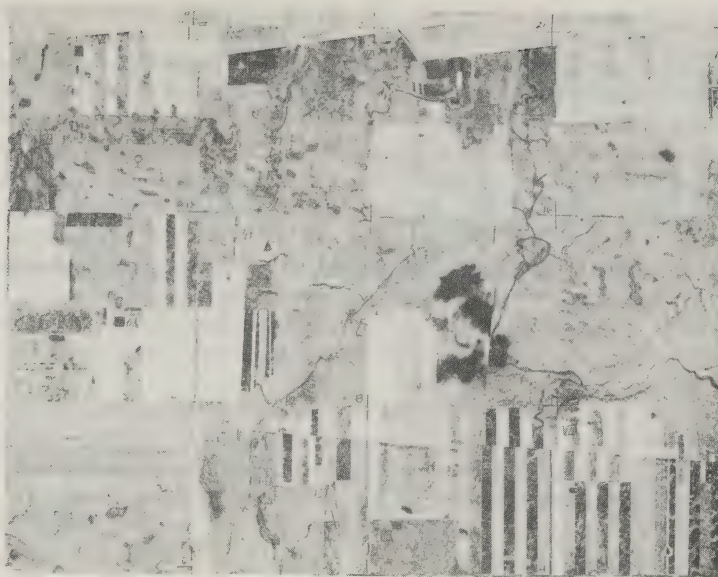
Testing apparatus for scale models of reinforced concrete conduits, showing a Design engineer reading gauges for pressure and deformations.

Ref. # 15870

## AIR PHOTO ANALYSIS AND ENGINEERING GEOLOGY DIVISION

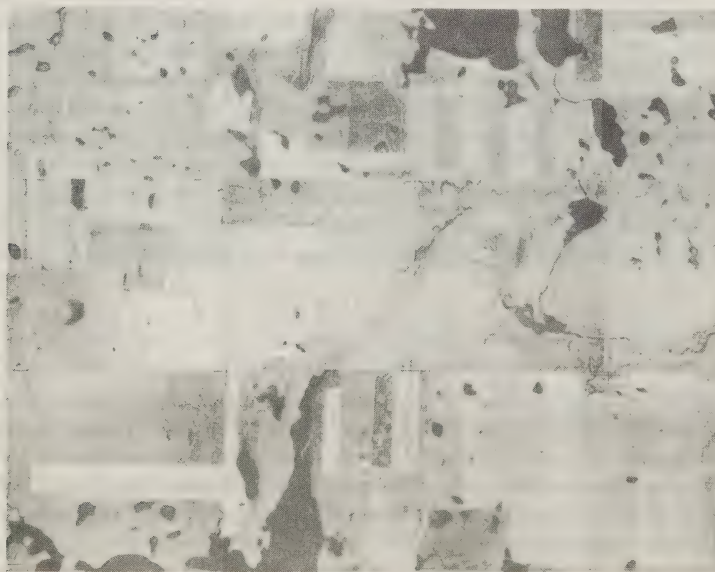
The services of the Air Photo Analysis and Engineering Geology Division fall into two main categories. The first is the provision of both qualitative and quantitative data derived from air photos. Included in this is the detailed interpretation and analysis of air photos, the compilation of plans by photogrammetric techniques, the maintenance of an air photo library for the convenience of all divisions and sections of P.F.R.A., and the supplying of mosaics to field personnel. The second responsibility is the provision of geologic information to assist in the investigation and design of major P.F.R.A. projects. This information includes data relating to the origin and history of valleys, and the engineering properties, origin, and mode of deposition of geologic materials.





Air photo studies of comparative mosaics in different years indicate changes in the drainage pattern, flooded area, agricultural methods and alkali accumulation. Note cloud shadow near centre of the above mosaic. (1938 photo)

Ref. # 15873



Same area as above. (1955 photo)

Ref. # 15874



The major activities of this division during 1957-58 included engineering geology reports, reconnaissance air photo studies, photogrammetric mapping, air photo library work and the assembling of mosaics. Three engineering geology reports based on field investigations were prepared for damsites in the Upper Assiniboine River basin.

By office examinations of air photographs, six photo reconnaissance reports were completed during 1957-58, five for damsite locations in five different areas, and one of surface features, soils and vegetation in the San Clara Community Pasture.

Reports on the accuracy and costs involved of topographic mapping by use of the Balplex, Multiplex and other projection equipment, were prepared during 1957. Topographic mapping of proposed reservoir areas were compiled by the Balplex Plotter on eleven proposed damsites, most of which were in the Upper Assiniboine River watershed.

New air photo coverage was received during the year either by special agreement with the Inter-departmental Committee on Air Surveys, by purchase from the National Air Photo Library in Ottawa, or by contract with private air photography companies. The following coverage was obtained: -

Shell River area	-	1700	square miles
Upper Shell River area	-	110	" "
Big Boggy Creek area	-	24	" "
Central Alberta area	-	3400	" "
Cowichan Indian Reserve	-	25	" "
Interlake area of Manitoba	-	125	" "

During the year, 159 standard township mosaics were constructed for various purposes. This brings the total available to March 31, 1958 to 1044. Several semi-controlled project mosaics were constructed for special purposes. These included the proposed South Saskatchewan River project Site 10, and the alternative Site 8, the Cowichan Indian Reserve, the northeast shore of Buffalo Pound Lake and seven Community Pastures.

Many studies of lesser magnitude were carried out during the year. Most of these involved office air photo studies making a selection and assessment of sites for small dams and structures. Also carried out were quantitative studies employing air photos to measure lake areas, flooded areas, drainage basins, cultivated and bushed areas. Several air photo studies were made to locate deposits of sand, gravel and riprap for construction materials.

## DRAINAGE DIVISION

Soil salinity is a problem experienced in many areas in Western Canada. Without proper drainage on irrigated land, the salt and water content of the soil soon builds up to a point where the land becomes unproductive. The Drainage Division of the P.F.R.A. was organized in 1949 to investigate and find solutions to the drainage and alkali problems arising on P.F.R.A. irrigation projects.

During the development of irrigation projects, the Drainage Division works closely with other services on the location of canals, on problems associated with canal seepage, and on the location and types of drains for specific soil types. In addition, through special surveys and experimental work, this Division obtains information for maintenance and reclamation of irrigated land.

The activities of the 1957-58 season included investigations, surveys, construction and reclamation work on the Bow River and St. Mary Projects in Alberta and the Eastend, Maple Creek and Swift Current Irrigation Projects in Saskatchewan.

## Bow River Project

### Farm Use of Water

Studies were continued in co-operation with the Experimental Farms Service to determine the actual farm use of irrigation waters and to obtain a comparative value of irrigation efficiency. The fourth year of study indicated again that water applications were too large and often too few during the growing season, with each irrigation exceeding the soil root zone storage capacity. As a result, irrigation efficiencies are low even on levelled land.

### Groundwater Observations

The reading of permanent piezometers installed in the Vauxhall area in 1951 showed a slight upward trend in the groundwater levels as compared to 1956 readings. Observation wells were installed in the Drain 1 area to provide groundwater information to aid in planning reclamation measures for that area. Investigations were continued to check the effectiveness and influence of the tile drains. Generally, the tile drains are maintaining the water table at a desirable depth. Discharge flows during the year range from 3 to 200 gallons per minute.

### Drainage Surveys

Drainage surveys were made on Drains 1 and 9 to locate and record elevations of piezometers, observation wells, and drill holes. Location and profile surveys of tentative drains were completed during the year. Topographic mapping and location surveys of soil test holes were made in conjunction with land classification surveys in the Vauxhall, Taber and Tempest areas. Topographic surveys were completed on four parcels of land in the Hays area, and location and profile surveys were made on Distributary "U". Miscellaneous surveys were conducted at various locations to assist with drainage problems in those areas.

### Land Levelling

Land levelling surveys were completed on approximately 361 acres for 10 farmers in the Vauxhall area. In addition, surveys, plans and construction were completed on 160 acres of government owned land, and on 11.5 acres at the Lethbridge Experimental Station. A yield and land use survey was conducted in August 1957 on previously levelled land.

Fertility and bacteriological studies have been made in the laboratory on field soil samples from levelled fields to assess the problems of restoring them to full production. Greenhouse trials using soils from cut areas, show the greatest increase in plant growth with the use of barnyard manure plus ammonium phosphate fertilizers.

### Distributary "U"

Investigations started in 1955 to determine cultural and irrigation practices necessary to bring the area under sustained irrigation agriculture were continued. The 1957 program was extended to include 2 fields irrigated by the sprinkler method in addition to the 2 fields which were previously levelled and basin irrigated.

The possibility of using sub-surface irrigation was further investigated. Experience on the two levelled fields show that a combination of surface and subsurface irrigation can reduce the requirements to one or two applications when the water table is held at approximately 3 feet during the growing season.

Six irrigations were necessary on the sprinkler irrigated fields in 1957. The water holding capacity of the sandy soils is considered to be about 1 inch per foot of soil depth. This meets the minimum standards usually required in this respect.

When other factors including soil management problems, and the distribution and drainage layout are considered further in project planning, it is unlikely that the area will be considered feasible for irrigation development. Soil investigations were made on Lateral Y and P as these areas are being considered for irrigation.



Leaching experiments at Vauxhall using shallow tile drain plots. Drain outlets are at the left side of the picture.

Ref. # 14368



### Drainage Investigations

Leaching studies were continued during 1957-58 in an area which had limited production over the past years due to salinity and poor surface drainage. The use of dykes to pond water and the addition of gypsum are being tested in this area. The practicability of shallow tile drains in medium textured soils with dense subsoils is also being tested by the Drainage Division.

### Dugout Investigations

A total of 56 dugout sites were located in the Vauxhall and Hays areas during 1957-58. Compacted earth lining was recommended for 5 of these dugouts. These were lined by project staff and showed negligible losses during the 6 month interval they contained water.

### Irrigation and Drain Water Studies

Testing of irrigation water throughout the Bow River Project for salt content was extended in 1957 so that coverage was obtained from the Carseland Diversion to Ronalane Spillway. It was again found that the salt concentration of the irrigation water increases considerably as it passes through the reservoirs, particularly the Little Bow Reservoir.

As in previous years the salt concentration in the drain waters tends to vary with the flow. Flow rates up to 150 gallons per minute were recorded from some tile drains. The salt concentration of waters from tile drains is higher than that of water from open drains.

## St. Mary Irrigation Project

### Soil and Water Investigations

A small area of the Lethbridge Experimental Farm was investigated to determine the suitability of soils for levelling.

The Lethbridge P.F.R.A. Office and the Provincial Irrigation Extension Service collected water samples throughout the St. Mary Project for analysis. There was a slight increase in salt content toward the eastern section of the project, but the water is of good quality for irrigation. This water was somewhat lower in salt and sodium content than waters used on the Bow River Project.

## Eastern Irrigation District

### Soil and Water Investigations

Measurements of groundwater levels and salt content at selected sites, were begun late in 1957. Results to date show considerable variation in salt content of the groundwater indicating a variation in the salt content of the underlying soils.

Water quality throughout the project shows very little change in salt content. This is in contrast to the waters of the Bow River and St. Mary projects which tend to pick up salt in the reservoirs.



## Saskatchewan Irrigation Projects

### Soil and Water Investigations

The results of the soil sampling carried out in the Rush Lake area of the Swift Current project are being analyzed in order to outline the boundaries of the salinity classes.

In co-operation with the Swift Current P.F.R.A. office, water samples were collected from the various irrigation projects in southwestern Saskatchewan. In all cases the water was considered satisfactory for irrigation purposes.

## CONSTRUCTION, EQUIPMENT AND SUPPLY DIVISION

The extent of P.F.R.A. and major project activities outlined in this report obviously require equipment, supplies and services of various kinds. The function of the Construction, Equipment and Supply division is to provide all branches of the organization with the requirements which they are not providing for themselves and which cannot be obtained, or are difficult to obtain from local sources. The division administers the vehicle fleet, maintenance equipment, camp equipment, fire prevention and safety program and the inventory of equipment and buildings. It operates a building material stores and provides a purchasing service for all branches of P.F.R.A. It provides, and supervises, maintenance and construction crews for work which cannot be done on a local contract basis. This work is required on irrigation and water storage projects, on community pastures operated by P.F.R.A. or on community water storage projects which are maintained and operated by P.F.R.A. for a period after initial construction.

Vehicles used by the organization include over 300 cars, trucks and jeeps. These are allocated to various divisions and projects according to their needs. Most of the routine maintenance of vehicles is done by local garage facilities in the area in which the vehicle is operated. Some major overhaul work is done in a well equipped vehicle repair shop at Moose Jaw. Much of the repair work of vehicles used on the Bow River project is done in the shop at Vauxhall. The useful life of vehicles varies according to the type of vehicle, the nature of the work on which it is used, and the effectiveness of the maintenance it has received, but the objective is to operate cars and trucks at least 60,000 miles before replacement. Many four wheel drive vehicles which are not used for long distance travel will not reach this mileage before replacement becomes necessary while some of the larger truck units often exceed 100,000 miles with relatively low maintenance costs. When a vehicle is to be replaced it is offered as a trade-in on a specified type of vehicle and tenders are invited from dealers in the area where the vehicle has been or is expected to be operated.

During the past year the shops in Moose Jaw carried out repair and maintenance work on over 100 units of construction type equipment such as crawler tractor, pumps and concrete equipment. Equipment used for operation and maintenance work on the Bow River Project is based at Vauxhall, Alberta, where a project shop is equipped to do most of the necessary equipment repairs.

Repairs and modifications were made to camp trailers and equipment, and in addition, ten new units were built to replace old units which were no longer serviceable. Field crews are housed in camp trailers which are equipped to provide sleeping quarters, kitchen, dining and washroom facilities as required. These camp units, built in the shop during winter months, help provide winter employment for some field staff.

The extensive and varied nature of the work undertaken by P.F.R.A. necessitates considerable structure maintenance each year. Many structures built fifteen to twenty years ago require renewal and newer structures sometimes need modification to better perform their intended function. Any new or replacement work is done, as far as possible, in a manner which will reduce future maintenance costs to a minimum and enable the works to be operated with basic operating personnel. This program of renewal and renovation entails the use of reinforced concrete, steel, pressure treated timber and associated materials.

While some of these works can be undertaken by standard contract there are many others, frequently in remote locations and often relatively small in size, that local contractors are not equipped to undertake, and which are not of interest to larger contractors at a reasonable cost. This type of job is being done effectively with well organized and equipped crews of P.F.R.A. personnel. These crews are generally self contained and can move from place to place with basic personnel and equipment and add local manpower as the need arises. Some local equipment can also be hired for many of these jobs so that the maintenance crew need have only those items not available in the district.

During the past year crews of this nature undertook more than 90 different jobs ranging in size from the use of a dragline for a few hours to replacing a damaged spillway involving a labour crew of up to 30 men over a four month period.



P.F.R.A. construction equipment replacing the Russell Creek spillway. Pouring enclosure and batching set-up used for running cement following a heavy snow - storm late in October 1957.

Ref. # 14289

The improvement work in the community pastures requires a number of special jobs such as land clearing, cleaning out springs for water supply and building water control structures. The problem of providing fireguards in the prairie pastures is a continuing one with more than 700 miles being done with motor grader equipment last year.

While operational work of this nature requires a basic staff of skilled men who receive experienced supervision, it has not been necessary to expand the number of con-

tinuing employees beyond the crew foremen and key machine operators. These men are employed during the winter months in equipment repair and winter construction work, and are supplemented by season employees as the need arises.

A fire prevention and safety program is carried on throughout the whole organization with regular inspection by an experienced and qualified supervisor. All community pasture headquarter buildings are inspected and reported on at least once each year. Mobile field camps are inspected several times during the summer season, usually when a camp is moved from one area to another. The number of on-the-job accidents has been relatively few and no serious building fires occurred during the year although the effect of the fire prevention program obviously prevented some minor incidents becoming major accidents.



## PLANNING AND INFORMATION DIVISION

The Planning and Information Division was established in 1949 to provide planning and information, library and photographic services to all branches and divisions of the Organization.

The principal duty of this section is to collect and assemble factual information pertaining to the history and development of P.F.R.A. projects for use as a guide in future planning and in the preparation of reports and publications required for public distribution. Included in this work is the preparation of progress and summary reports on P.F.R.A. projects; the preparation of the P.F.R.A. Annual Report; and the preparation of annual reports on P.F.R.A. activities used in the Annual Report of the Minister of Agriculture, and the Canada Year Book. In addition, it involves preparing and editing material on P.F.R.A. activities used in articles appearing in technical journals, magazines and newspapers; filling requests for information on P.F.R.A. activities from schools, government and private agencies, and research institutions; and carrying out special research assignments as required by the Director or other divisions of P.F.R.A.

The section is also called upon at times to represent P.F.R.A. on special departmental and inter-departmental committees, act as secretary at meetings arranged by P.F.R.A., and handle arrangements for public events.

A further activity of the section is to be responsible for arranging the program and itinerary of visitors to P.F.R.A. from other parts of Canada and from other countries. During the past year several Columbo Plan students, in addition to other visitors, were given an opportunity to become familiar with the various phases of rehabilitation and reclamation work carried out by P.F.R.A.

The Planning and Information Division also supervises the operations of the P.F.R.A. Library and Photographic Section in Regina. The principal responsibilities of the Library include the ordering and distribution of books, periodicals, and publications required by P.F.R.A. headquarters or field offices; the maintaining of a record of all books, publications and government documents held by P.F.R.A. either in the central library in Regina or in division or field offices; and the filing of pamphlets, bulletins, reports and books of particular interest in P.F.R.A. work as a ready reference for all members of the organization. The library also provides an inter-library loaning service to the divisions, branches and offices of P.F.R.A. as well as other Federal Department of Agriculture offices in Regina, Indian Head and Swift Current.

The Photo Section provides photographic services to all divisions and branches of P.F.R.A. and also to other Federal Government Departments in Regina and Indian Head. It also assumes responsibility for the care of P.F.R.A. photographic equipment, and maintains a complete file of pertinent P.F.R.A. black and white prints, negatives, and colour slides.

The production in this Section has been increasing over the past few years. Over 900 requests were received for various types of photographic work during the past year. This work involved the developing of about 250 rolls of film, the making of over 2100 copies, the printing of some 21,464 black and white pictures varying in size from 4" x 5" to 16" x 21",

the copying and printing of around 1000 mosaics and the mounting of over 6000 prints.

During the year emphasis in the photographic program was given to the photo coverage of agricultural development taking place on irrigation projects both in Saskatchewan and Alberta. In addition, a photo record was kept on the projects completed or under construction during the 1957-58 season. At the first of the year the Planning and Information Division gave special attention to establishing an active filing system for some 17,000 black and white prints and a corresponding file for approximately 3000 colour slides. These files not only greatly expedite the handling of photographic material in Regina but also serve as a basis for filing photographs in branch offices.



Printing room of the P.F.R.A. Photographic Section showing enlargers, contact printer and print developing facilities.

Ref. # 15872

In addition to the routine duties performed by the Planning and Information Division, a summary record was maintained of all projects submitted for authorization, and progress and summary reports were kept on projects currently under construction or recently completed.

Numerous separate requests for information on the work and program of P.F.R.A. were handled during the year by this Division. These requests were received from educational institutions, newspaper and magazine publishers, Government Departments in Canada and abroad, and private individuals living in all parts of Canada and in other countries.

# APPENDIX I

## PRAIRIE FARM REHABILITATION ACT

Showing number of projects and amount of financial assistance paid since the inauguration of program to  
March 31, 1958

Province & Classification	DUGOUTS			STOCKWATERING DAMS			IRRIGATION SCHEMES			TOTALS		
	Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid		Projects Paid	Financial Assistance Paid	
<u>MANITOBA</u> <u>Individual</u> Neighbor & Community	10,683	1,058,739.60	311	23,032.91	40,159.73	11,134	1,121,932.24					
	47	9,282.04	26	20,449.43	2,212.62	81	31,944.09					
	10,730	1,068,021.64	337	43,482.34	42,372.35	11,215	1,153,876.33					
<u>SASKATCHEWAN</u> <u>Individual</u> Neighbor & Community	29,658	3,304,161.76	4,208	361,412.78	479,636.71	35,972	4,145,211.25					
	451	186,096.77	143	99,197.97	38,727.15	686	324,021.89					
	30,109	3,490,258.53	4,351	460,610.75	518,363.86	36,658	4,469,233.14					
<u>ALBERTA</u> <u>Individual</u> Neighbor & Community	4,934	508,673.67	2,180	206,543.42	237,401.21	8,115	952,618.30					
	40	13,162.71	45	28,337.61	13,415.77	106	54,916.09					
	4,974	521,836.38	2,225	234,881.03	250,816.98	8,221	1,007,534.39					
GRAND TOTAL	45,813	5,080,116.55	6,913	738,974.12	811,553.19	56,094	6,630,643.86					



# APPENDIX II

Progress by Years in the Construction of Small Projects P.F.R.A. Water Development Program  
1935 to March 31, 1958

Fiscal Year	Number of Projects Constructed			Financial Assistance Paid on Projects				
	(1) DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
1935-36	49	28	5	82	1,558.53	2,374.04	869.51	4,802.08
1936-37	859	465	101	1,425	41,053.44	36,022.13	17,608.74	94,684.31
1937-38	1,493	850	215	2,558	105,293.19	83,287.75	41,419.06	230,000.00
1938-39	2,745	855	178	3,778	283,445.40	105,998.08	29,493.11	418,936.59
1939-40	1,023	193	44	1,260	166,836.34	65,785.92	6,419.91	239,042.17
1940-41	4,433	877	232	5,542	529,350.72	86,515.21	37,244.38	653,110.31
1941-42	2,773	447	115	3,335	288,754.54	36,890.14	18,987.16	344,631.84
1942-43	1,275	174	44	1,493	120,049.61	13,755.46	5,759.93	139,565.00
1943-44	1,073	202	32	1,307	103,918.24	17,625.54	5,812.26	127,356.04
1944-45	3,119	221	38	3,378	339,064.47	20,704.26	5,257.78	365,026.51
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	194	48	5,187	581,172.05	19,549.87	8,697.82	609,419.74
1947-48	1,804	226	56	2,086	202,443.78	22,256.56	8,797.00	233,497.34
1948-49	1,505	193	62	1,760	167,718.66	20,983.66	12,993.82	201,696.14
1949-50	3,020	145	111	3,276	354,582.32	13,715.64	29,742.83	398,040.79
1950-51	3,432	472	716	4,620	400,960.36	49,522.08	203,979.40	654,461.84
1951-52	473	96	343	912	55,172.10	10,146.32	109,556.66	174,875.08
1952-53	861	119	288	1,268	100,219.54	13,382.92	92,397.46	205,999.92
1953-54	1,774	178	181	2,133	204,148.93	18,373.83	46,550.99	269,073.75
1954-55	1,300	234	180	1,714	149,184.48	24,751.11	44,473.20	218,408.79
1955-56	493	145	104	742	56,733.44	15,028.46	23,236.94	94,998.84
1956-57	850	126	98	1,074	93,930.68	13,932.33	23,620.24	131,483.25
1957-58	2,198	212	149	2,559	244,743.60	20,620.25	33,949.71	299,313.56
TOTAL	45,813	6,913	3,368	56,094	5,080,116.55	738,974.12	811,553.19	6,630,643.86

(1) DO - Dugout

SWD - Stock Watering Dam

IRR - Individual Irrigation Project



APPENDIX III  
WATER DEVELOPMENT - IRRIGATION PROJECTS - STORAGE - COMMUNITY PROJECTS  
To March 31, 1958

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	-	-	5,250.00
Birtle Dam	Birtle	Stockwatering	1947	-	-	11,490.00
Boissevain	Boissevain	Storage	1954	-	580	29,992.00
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	-	27,107.00
Brandon Water Supply	Brandon	Storage	1940	-	500	3,996.00
Clearwater Storage	Clearwater	Stockwatering	1938	-	12	5,949.00
Crystal City Storage	Crystal City	Stockwatering	1935	-	3	3,334.00
Dead Horse Creek Dam	Morden	Irr. & Stockwatering	1941	100	1,200	344,274.00
Dead Lake Community	Gladstone	Irr. & Stockwatering	1950	20	90	1,933.00
Deloraine	Deloraine	Stockwatering	1953	-	1.5	770.00
Edwards, R. M. of	Melita	Stockwatering	1935	-	100	10,214.00
Hague Dam	Sanford	Stockwatering	1953	-	-	29,183.00
Hampson Dam	Sanford	Storage	1954	-	420	16,899.00
Hartney	Hartney	Irr. & Dam	1941	-	-	10,264.00
Killarney	Killarney	Multi-purpose Res.	1956	-	800	41,965.00
LaSalle River Dams	LaSalle	Stockwatering	1941	-	900	22,989.00
Lewko Dam	Sanford	Storage	1954	-	320	20,874.00
Little Souris River Dam	Melita	Stockwatering	1945	-	250	1,380.00

Name of Project	Location	Type of Project	Complete	Irr. Ac.	Acre Feet	Costs
McAuley Community Dam Melita	McAuley Melita	Stockwatering Irr. & Dam	1955 1941	- 3,900	20 3,200	2,051.00 11,372.00
Minnedosa Dam	Minnedosa	Storage	1950	20	1,500	105,051.00
Morris River - Rock Lake	Carman	Stockwatering	1940	-	10,000	23,401.00
Napinka	Napinka	Irr. & Dam	1941	-	-	6,770.00
Oak Lake	Oak Lake	Irrigation	1956	13,000	-	119,205.00
Park Lake	Neepawa	Stockwatering	1953	-	-	21,626.00
Plum Coulee	Plum Coulee	Multi-purpose Res.	1957	-	12	5,939.00
Roland	Roland	Stockwatering Dugout	1957	-	1.5	1,000.00
Rosebank Dam	Rosebank	Stockwatering	1948	-	32	12,161.00
Roseau River Dam	Dominion City	Multi-purpose Res.	1957	-	-	54,705.00
Shoal Lake Project	Shoal Lake	Stockwatering	1948	-	3,500	8,491.00
Souris Dam	Souris	Multi-purpose Dam	1952	-	150	73,597.00
Souris, Town of	Souris	Stockwatering	1935	-	150	3,841.00
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	-	5	1,470.00
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968.00
Waskada	Waskada	Stockwatering	1953	-	1.5	853.00
Wawanesa	Wawanesa	Irr. & Dam	1941	-	-	125,332.00
Westbourne, R.M. of	Gladstone	Stockwatering	1947	-	-	5,993.00
Whitemud River	Woodside	Stockwatering	1949	-	160	6,506.00
Whitemud River Storage	Gladstone	Stockwatering	1943	-	660	11,464.00
SASKATCHEWAN						
Aberdeen, R.M. of	Aberdeen	Dugout	1955	-	1.5	916.00
Adair Creek	Walseley	Multi-purpose Dam	1956	40	350	59,849.00
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Airdale	Senlac	Dugout	1955	-	1.5	859.00
Allan	Allan	Stockwatering	1948	-	300	4,477.00
Alpine	Senlac	Dugout	1956	-	1.5	877.00
Alticane	Richard	Stockwatering	1951	-	2.5	858.00
Amsterdam	Amsterdam	Stockwatering Dugout	1957	-	1.5	629.00
Arcola	Arcola	Stockwatering	1939	-	(underground)	17,310.00
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000.00
Avon Heights Grazing Co-op.	Sh Shaunavon	Stockwatering	1955	-	60	2,428.00
Avonhurst	Qu'Appelle	Stockwatering	1956	-	1.5	3,200.00
Baildon and Tilney	Baildon	Stockwatering	1950	-	4	780.00
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203.00
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294.00
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739.00
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058.00
Beadle	Beadle	Stockwatering	1949	-	2	997.00
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998.00
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746.00
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Beechy Co-op.	Beechy	Stockwatering Dugout	1957	-	1.5	1,000.00
Bengough	Bengough	Stockwatering Dugout	1957	-	1.5	1,000.00
Big Arm Storage	Liberty	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520.00
Boharm	Boharm	Stockwatering	1948	-	100	6,250.00
Boharm Community Dugout	Boharm	Multi-purpose Res.	1956	-	1.5	998.00
Bracken	Bracken	Stockwatering	1946	-	158	1,001.00
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
Bright Water Creek	Hanley	Irrigation	1956	2,500	3,500	11,713.00
Brock Community	Brock	Stockwatering	1949	-	2	951.00
Brown Hill	Grenfell	Multi-purpose Res.	Incomplete	-	275	7,394.00
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Cabri	Cabri	Stockwatering	1948	-	340	37,553.00
Cactus Lake	Cactus Lake	Stockwatering	1949	-	2	730.00
Cadillac	Cadillac	Irrigation & Dam	1945	800	1,350	32,887.00
Camberley	Camberley	Irrigation & Dam	1950	-	100	2,106.00
Canora	Canora	Storage	1941	-	300	16,128.00
Carleton, Hamlet of	Carleton	Dugout	1955	-	1.5	998.00
Caron	Caron	Storage	1948	-	100	17,109.00
Caron Community (Dam)	Caron	Stockwatering	1949	-	4	697.00
Caron Water Development	Thunder Creek	Storage & Dam	1944	-	43,500	710,433.00
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999.00
Ceylon Reservoir	Ceylon	Irrigation & Dam	Incomplete	300	250	6,396.00
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208.00
Clair Creek	Wadena	Flood Irrigation	Incomplete	100	-	1,877.00
Claydon	Claydon	Multi-purpose Res.	1957	-	30	2,498.00
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999.00
Coleville	Coleville	Stockwatering Dugout	1957	-	1.5	805.00
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000.00
Consul - Vidora	Vidora	Irrigation	1950	3,000	-	62,500.00
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807.00
Crane Valley	Viceroy	Stockwatering	1950	-	2	599.00
Craven Dam	Qu'Appelle Valley	Irrigation	1943	x	-	33,675.00
Crooked & Round Lake	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	48,650.00
Cut Knife	Cut Knife	Stockwatering	1950	-	5	280.00
Cypress Storage	Ravenscrag	Storage for Irrigation	1939	20,000	80,000	467,691.00
Dalmeny	Warman	Stockwatering Dugout	1957	-	1.5	994.00
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000.00
Davidson	Davidson	Irrigation & Dam	1937	100	277	3,114.00
Davin	Kronau	Stockwatering	1947	-	1,080	13,501.00
Dead Lake	Macoun	Irrigation & Dam	1941	Souris River Development		17,528.00
Delisle	Delisle	Stockwatering	1950	-	45	4,899.00
Denzil	Macklin	Stockwatering	1951	-	2	975.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Star. Cap. Acre Feet	Costs
Dodsland	Druid	Stockwatering Dugout	1957	-	1.5	805.00
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,438.00
Dry Lake	Forward	Stockwatering	1949	-	600	9,729.00
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996.00
Dunning	Radville	Irrigation	1951	120	200	3,566.00
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742.00
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432.00
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998.00
East Borden	Borden	Stockwatering	1950	-	60	526.00
East Manitou	Nielburg	Dugout	1953	-	1.5	789.00
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Eastview	Eastview	Stockwatering	1949	-	200	5,970.00
Eatonia	Eatonia	Stockwatering	1949	-	12	1,199.00
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	-	41,753.00
Egg Lake	Avonhurst	Multi-purpose Res.	1957	800	-	3,979.00
Elfros	Elfros	Stockwatering	1949	-	25	7,330.00
Elrose	Elrose	Stockwatering	1950	-	5	999.00
Eston	Eston	Stockwatering	1954	-	10	11,469.00
Fahlman's Creek Project	Balgonie	Stockwatering	1949	-	400	15,599.00
Fairy Hill	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	4,302.00
Fielding	Maymont	Stockwatering	1950	-	50	918.00
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596.00
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348.00
Fillmore Reclamation Project	Fillmore	Irrigation	Incomplete	1,600	-	656.00
Fleming	Moosomin	Stockwatering	1950	-	75	3,282.00
Foam Lake (Elfros)	Foam Lake	Flood Irrigation	1957	4,000	-	11,539.00
Francis Lake	Morse	Irrigation	Incomplete	1,560	-	17,305.00
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177.00
Girvin	Girvin	Stockwatering	1937	-	19	2,180.00
Glasnevin	Glasnevin	Dugout	1953	-	1.5	554.00
Glenside	Glenside	Stockwatering	1948	-	150	3,286.00
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783.00
Gordon Grazing	Chauvin	Dugout	1953	-	1.5	830.00
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186.00
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917.00
Grasnack	Lake Alma	Stockwatering Dugout	1957	-	1.5	1,000.00
Gunn Grazing Co-op	Shaunavon	Multi-purpose Res.	1957	-	10	1,632.00
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000.00
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748.00
Hanley	Hanley	Stockwatering	1946	-	60	3,797.00
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074.00
Hugonard Coulee Dam	Lebret	Multi-purpose Res.	1956	100	400	64,231.00
Jackfish Creek	Meota	Stockwatering	1943	-	90	2,940.00
Jubilee	Indian Head	Multi-purpose Res.	1956	-	1.5	979.00
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092.00
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946.00
Kaposvar Creek	Melville	Stockwatering	1954	-	1,400	102,747.00
Katepwa Weir	Katepwa	Water Control	1957	-	-	61,192.00
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927.00
Kerrobart	Kerrobart	Multi-purpose Res.	1957	-	40	11,554.00
Kincaid	Kincaid	Stockwatering	1956	-	10	2,539.00
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007.00
King George	Dinsmore	Stockwatering Dugout	1957	-	1.5	999.00
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
Koch-Froh	Qu'Appelle	Multi-purpose Res.	1956	160	-	2,390.00

Name of Project	Location	Type of Project	Completed	Irr., Ac.	Stor. Cap. Acre Feet	Costs
Lac Pelletier	Lac Pelletier	Stockwatering	1937	-	3,350	2,139.00
Lacadena	Lacadena	Irrigation	1954	-	-	9,678.00
Laird, R. M. of	Waldheim	Dugout	1953	-	1.5	999.00
Lafleche	Lafleche	Stockwatering	1940	-	38	2,524.00
Lafleche Dam	Lafleche	Multi-purpose Res.	Incomplete	15,000	30,120	539,687.00
Lajord	Lajord	Flood Control	1936	-	300	13,800.00
Lake of the Rivers	Assiniboia	Stockwatering	1938	-	300	10,805.00
Lance, Water Users	Lancer	Irrigation	1953	1,265	-	35,000.00
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752.00
Langenburg	Langenburg	Irrigation	Incomplete	-	2.5	3,000.00
Larsen	Radville	Multi-purpose Res.	1957	-	500	36,437.00
Last Mountain Lake	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	42,721.00
Lebret	Qu'Appelle Valley	Irr. & Water Control	1941	x	-	16,307.00
Lemsford	Lemsford	Stockwatering Dugout	1957	-	1.5	1,000.00
Leroy, R. M. of	Leroy	Stockwatering	1956	-	1.5	994.00
Linacre Grazing Co-op.	Fox Valley	Dugout	1955	-	1.5	644.00
Lodge Lake	Evesham	Dugout	1955	-	1.5	939.00
Little Manitou	Senlac	Dugout	1953	-	1.5	862.00
Little Manitou Lake	Watrous	Diversion Canal	1957	-	-	39,271.00
Lonesome Lake	Vidara	Irrigation	1949	900	800	2,771.00
Long Creek #1	Estevan	Stockwatering	1938	-	137	8,729.00
Long Creek #2	Estevan	Stockwatering	1938	-	90	8,701.00
Loon Creek	Markinch	Stockwatering	1945	-	700	7,180.00
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596.00
MacIntosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990.00
Macklin Storage	Macklin	Stockwatering	Incomplete	-	40	967.00
Manitou Cattle Breeders Co-op	Chauvin	Dugout	1955	-	1.5	935.00
Mankota Dam	Mankota	Stockwatering	1950	-	10	950.00
Maple Creek	Maple Creek	Irrigation & Dam	1938	10,000	23,260	356,179.00
March Flood Irrigation	Cedoux	Irrigation	1948	400	-	1,765.00
Masefield	Masefield	Stockwatering	1938	-	40	3,187.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Masefield Water Users	Masefield	Multi-purpose Res.	1957	500	250	7,999.00
Matador	Matador	Irrigation & Dam	1946	120	220	5,216.00
Maxim Lake	Maxim	Stockwatering	1949	-	5,000	20,472.00
McCreaney, R.M. of	Kenaston	Stockwatering	1937	-	350	1,896.00
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992.00
Meadowland	Macklin	Irrigation	1954	500	-	6,370.00
Meeting Lake	Redfield	Stockwatering	1949	-	100	2,683.00
Melaval	Melaval	Stockwatering	1950	-	18	1,200.00
Mennon	Waldheim	Stockwatering	1949	-	2	976.00
Meota, R.M. of	Meota	Dugout	1953	-	1.5	1,000.00
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663.00
Mine Coulee	Neptune	Stockwatering	1948	-	40	4,377.00
Monet	Hughton	Stockwatering	1949	-	10	878.00
Montague Lake	Assiniboia	Irrigation	Incomplete	235	-	1,000.00
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Irrigation	1937	-	8,000	14,829.00
Moosomin Dam (Keenan Bridge)	Moosomin	Multi-purpose Res.	1954	-	9,000	449,184.00
Mossbank	Mossbank	Stockwatering	1949	-	2	875.00
Muenster	Muenster	Irrigation	1949	25	11	2,754.00
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477.00
North Battleford, City of	N. Battleford	Dugout	1953	-	1.5	970.00
North End Grazing	Macklin	Dugout	1954	-	1.5	728.00
North Herbert Extension	Herbert	Irrigation	Incomplete	-	-	511,909.00
North Qu'Appelle	Fort Qu'Appelle	Stockwatering	1948	-	100	2,386.00
Oxbow	Oxbow	Irrigation & Dam	1941	3,900	3,200	17,436.00
Pangman	Pangman	Multi-purpose Res.	1957	30	125	5,533.00
Pasqua	Moose Jaw	Stockwatering	1948	-	40	3,777.00
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360.00
Pipestone Lake	Broadview	Stockwatering	1938	-	1,600	11,785.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Pleasant Creek	Lemberg	Storage	1954	-	500	114,464.00
Plenty, Village of	Plenty	Dugout	1955	-	1.5	893.00
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14,838.00
Portreeve	Portreeve	Stockwatering Dugout	1957	-	1.5	1,000.00
Prairiedale	Superb	Stockwatering	1949	-	2	987.00
Primate	Primate	Stockwatering Dugout	1957	-	1.5	1,000.00
Prospect Grazing Co-op.	Linacre	Stockwatering	1956	-	1.5	820.00
Radville	Radville	Stockwatering	1947	-	32	5,019.00
Readlyn	Readlyn	Stockwatering	1950	-	3	800.00
Reciprocity	Glen Ewen	Irrigation & Dam	1949	2,000	1,750	27,410.00
Reford	Wilkie	Stockwatering	1951	-	160	1,814.00
Reward	Reward	Stockwatering	1951	-	-	921.00
Richman Irrigation	Glen Bain	Irrigation	1949	-	1,000	4,607.00
Richardson-McKinnon	Consul	Irrigation	1946	3,000	-	53,913.00
Ridgeway Flats	Qu'Appelle	Multi-purpose	1957	65	80	2,054.00
Rockglen Grazing	Rockglen	Irrigation & Dam	1955	600	300	13,455.00
Rosedale	Hanley	Irrigation	1948	60	100	1,016.00
Rosemount Co-op.	Landis	Dugout	1953	-	1.5	903.00
Rough Bark Creek	Goodwater	Stockwatering	1937	-	1,500	9,314.00
Round Hill Water Users	N. Battleford	Irrigation & Dam	1950	425	50	4,791.00
Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
Saline	Invermay	Multi-purpose Res.	Incomplete	1,000	-	2,107.00
Salvador	Reward	Stockwatering	1951	-	5	1,000.00
Saskatoon	Saskatoon	Storage	1940	-	1,200	290,446.00
Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29,115.00
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962.00
Scotsguard	Shaunavon	Stockwatering Dugout	Incomplete	-	3	930.00
Shaheen	Rush Lake	Storage & Irrigation	1949	-	300	9,028.00
Sherwood	Regina	Dugout	1948	20	3	697.00
Shrimp Lake	Herschel	Stockwatering	1947	-	450	9,367.00
Sinfield	Kelvington	Multi-purpose Res.	1957	10	-	3,177.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	-	75	8,605.00
Smiley, Village of	Smiley	Dugout	1949	-	1.5	1,000.00
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998.00
Snake Bite	Beechy	Irrigation	1954	665	-	9,999.00
Snipe Lake	Eston	Stockwatering	1949	-	-	3,415.00
Snowdown	Fox Valley	Dugout	1954	-	1.5	898.00
Souris-Estevan	Estevan	Irrigation & Dam	1941	-	-	91,133.00
Souris River	Weyburn	Flood Control	1948	-	-	11,998.00
South Abernethy Project	Abernethy	Irrigation	Incomplete	320	-	14,568.00
Southey, Village of	Southey	Multi-purpose	1956	-	2	997.00
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Stelcam Community Dam	Stelcam	Stockwatering	Incomplete	-	360	9,791.00
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8,716.00
Stewart Valley Dugout	Stewart Valley	Stockwatering	1950	-	3	799.00
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961.00
Summerberry	Summerberry	Multi-purpose Res.	Incomplete	427	-	6,824.00
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837.00
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227.00
Sunbeam Creek	Indian Head	Multi-purpose Res.	Incomplete	100	300	5,216.00
Sunny South	Indian Head	Multi-purpose Res.	1956	-	1.5	990.00
Swan Hill Grazing Co-op.	Donavan	Dugout	1955	-	1.5	709.00
Swanson Co-op Pasture	Donavan	Stockwatering	1956	-	1.5	770.00
Swift Current	Swift Current	Irrigation & Dam	1946	30,000	95,000	816,472.00
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483.00
Tantallon	Tantallon	Stockwatering	1942	-	-	2,790.00
Tatagwa Lake	Weyburn	Flood Irrigation	Incomplete	10,000	-	17,428.00
Terrell, R.M.	Spring Valley	Stockwatering	1952	-	10	2,491.00
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204.00
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007.00
Tribune Dam	Tribune	Stockwatering	1950	-	300	6,499.00
Truax	Truax	Stockwatering	1949	-	250	11,899.00
Tuxford	Tuxford	Flood Irrigation	1957	800	-	7,320.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Twelve Mile Lake Tyvan	Maxstone Tyvan	Flood Irrigation Stockwatering	1956 1947	= =	- 1,000	7,998.00 11,986.00
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West	Val Marie	Irrigation	1940	4,230	2,000	150,639.00
Valeport Dyke	Valeport	Flood Control	Incomplete	1,500	-	95,562.00
Valley Centre	Bents	Stockwatering Dugout	1957	-	1.5	896.00
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	=	8,133.00
Vera Grazing	Vera	Dugout	1953	=	1.5	891.00
Vera Winter Grazing	Vera	Dugout	1954	=	1.5	939.00
Viceroy	Viceroy	Stockwatering	1950	=	3	798.00
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905.00
West Poplar #1	Kildeer	Multi-purpose Res.	1957	750	1,000	16,230.00
Weyburn	Weyburn	Flood Irrigation	1940	=	4,000	51,311.00
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452.00
Wilson Lake	Lizard Lake	Multi-purpose Res.	Incomplete	400	=	2,813.00
Witrock	Hodgeville	Irrigation	1947	520	=	3,884.00
Walseley	Walseley	Stockwatering	1948	=	20	1,800.00
Wolverine Creek	Humboldt	Stockwatering	1945	-	522	52,600.00
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337.00
Woodrow - Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
Wood River Development	Coderre and Gravelbourg	Stockwatering	1942	=	4,923	33,738.00
Wynn Community Project	Walseley	Multi-purpose Reclamation	1957	500	-	3,152.00
Wynyard	Wynyard	Stockwatering	1947	-	35	6,225.00
Yanker Grazing Co-op. Young	Chauvin Young	Dugout Stockwatering	1955 1948	- =	1.5 250	807.00 8,892.00

(x) Ultimate irrigation development for all projects along  
Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).

ALBERTA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acire Feet	Costs
Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252.00
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000.00
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004.00
Amrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
Anatole	Hanna	Stockwatering	1953	-	7	2,990.00
Antelope Park	Nemiscam	Stockwatering Dugout	1957	-	1.5	1,000.00
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912.00
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300.00
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990.00
Balzac	Balzac	Irrigation	1956	900	-	8,141.00
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600.00
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029.00
Bartman Dam	Cessford	Irrigation & Dam	1943	1,000	3,000	49,100.00
Beauvais Lake	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Beaver Creek Stock Assoc.	Fort MacLeod	Dugout	1955	-	-	981.00
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996.00
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493.00
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884.00
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500.00
Bowell	Bowell	Dugout	1954	-	1.5	1,000.00
Bowell West Grazing Assoc.	Bowell	Dugout	1955	-	1.5	744.00
Bow Island 40 Mile Grazing	Bow Island	Dugout	1954	-	1.5	782.00
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14,860.00
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631.00
B.T. Grazing Co-op.	Hilda	Stockwatering	1956	-	1.5	1,000.00
Bull Pound Creek	Hanna	Stockwatering	1939	-	2,000	-
Bullshead Creek	Medicine Hat	Irrigation & Dam	1940	800	1,130	8,170.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Burke Creek	Claresholm	Stockwatering Dugout	1957	-	6	3,890.00
Burmis Creek	Burmis	Multi-purpose Res.	1957	550	250	14,683.00
Cameron	Youngstown	Multi-purpose Dam	Incomplete	662	1,000	3,905.00
# Canada Land & Irrig. Project	Medicine Hat	Irrigation	1936	45,000	-	80,000.00
Caranova	Bowell	Multi-purpose Res.	1957	500	250	8,199.00
Carbon	Carbon	Multi-purpose Res.	1957	300	50	8,958.00
Champion	Champion	Irrigation	1954	2,500	-	4,984.00
Chipman Creek	Burmis	Flood Irrigation	1957	700	-	3,298.00
Clear Lake	High River	Stockwatering	1948	-	10,000	35,000.00
Collins	Sheerness	Stockwatering Res.	1956	-	40	3,495.00
Commodore	Vulcan	Irrigation	1954	400	-	3,990.00
Comrey Grazing	Comrey	Dugout	1953	-	1.5	1,000.00
Comrey #2	Comrey	Dugout	1954	-	1.5	980.00
Conrich	West Calgary	Irrigation	1954	1,600	-	6,240.00
Consort	Hanna	Stockwatering	1955	-	20	9,651.00
Cowley Community	Cowley	Irrigation	1952	750	-	4,666.00
Cressday	Medicine Hat	Stockwatering	1954	-	-	13,541.00
Cutbank Coulee	Cressday	Stockwatering Res.	Incomplete	350	500	2,337.00
C.Y. Water Users	Taber	Stockwatering	1949	-	310	16,477.00
D'Arcy	Hanna	Multi-purpose Res.	1957	-	15	2,116.00
Dead Fish Creek	Cessford	Irrigation	1949	4,000	5,000	47,832.00
Del Bonita	Twin River	Stockwatering	1955	-	250	9,196.00
Delia	Morrin	Stockwatering	Incomplete	-	165	3,914.00
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4,368.00
East Berry Creek	Roselynn	Irrigation	1949	1,500	750	9,677.00
Eastern Irrigation District	Brooks	Irrigation	1937	2,280	22,000	22,490.00
Esler	Hanna	Stockwatering	1954	-	17	2,808.00
Esther Flood Irrigation	Macklin	Irrigation	1952	4,000	5,000	4,592.00
Eureka Irrigation Project	Grassy Lake	Irrigation	1949	12,000	1,000	38,568.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Fertility Grazing Assoc. Fish Lake	Hanna Pincher Creek	Stockwatering Irrigation & Dam	1956 1954	- 1,000	1.5 -	998.00 6,895.00
Franklin Coulee	Retlaw	Stockwatering	1948	-	1,500	20,125.00
Garden Plains	Hanna	Stockwatering	1956	-	1.5	999.00
Graham Creek	Calgary	Stockwatering	1943	-	230	8,529.00
Grainger	Three Hills	Multi-purpose Res.	1956	30	117	9,482.00
Greasewood Coulee	Manyberries	Irrigation & Dam	1954	500	650	9,798.00
Green Butte	Hanna	Stockwatering Dugout	1957	-	1.5	995.00
Hampton	Youngstown	Multi-purpose Res.	1957	2,000	401	8,000.00
Hanna	Hanna	Stockwatering	1948	-	500	29,498.00
Hilda Community Project	Hilda	Multi-purpose Dugout	Incomplete	-	10	5,180.00
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000.00
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795.00
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843.00
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799.00
Jaydot	Elkwater	Multi-purpose Res.	1956	300	400	8,988.00
Kathryn	Calgary	Irrigation & Dam	1954	300	-	9,184.00
Lake Valley	Bowell	Stockwatering Dugout	1957	-	1.5	1,000.00
# Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578.00
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345.00
Loveland	Hanna	Irrigation	1954	3,000	-	17,655.00
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993.00
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689.00
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917.00
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
McLaren	Michichi	Multi-purpose Res.	1957	150	660	13,815.00
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600.00
# Magrath	Magrath	Irrigation	1939	4,000	-	2,756.00
Meadow Creek Dam	Clareholm	Irrigation	1952	1,500	-	5,630.00
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644.00
Morley	Morley	Stockwatering	1956	-	1.5	980.00
Mountain View	Mountain View	Storage	1936	-	4,200	3,000.00
Naismith	Youngstown	Multi-purpose Res.	1956	300	145	9,421.00
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000.00
Nester	Cessford	Multi-purpose Res.	1957	300	1,350	8,670.00
Nobleford Water Users	Nobleford	2 Dugouts	1953	-	3	11,173.00
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943.00
Oyen	Oyen	Stockwatering Dugout	1957	-	1.5	1,000.00
Pancost - Olson Water Users	Bowell	Dugout	1955	-	1.5	999.00
Parfles	Chancellor	Irrigation	1954	250	-	4,730.00
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993.00
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782.00
Petiski Grazing Assoc.	Nanton	Stockwatering	1955	-	1.5	990.00
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00
Pollockville	Pollockville	Stockwatering Dugout	1957	-	1.5	998.00
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project		
Priddis	High River	Stockwatering	1955	-	312	8,802.00
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	4,812.00
Ranchville Community Res.	Ranchville	Irrigation	1957	300	-	4,950.00
# Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
Rock Lake Project	Brooks	Irrigation Res.	1957	11,000	-	133,984.00
# Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839.00

Rose Glen Water Users	Schuler	Multi-purpose Dam	1957	200	150	6,780.00
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00
Ross Lake Community	Raymond	Stockwatering	1950	-	300	7,987.00
Rough Meadow Reservoir	Coronation	Irrigation	Incomplete	200	-	2,471.00
Ruks	Pincher Creek	Irrigation & Dam	1954	900	250	6,484.00
Schuler Water Users	Schuler	Multi-purpose Res.	Incomplete			5,443.00
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518.00
Seven Persons	Seven Persons	Stockwatering	1943	-	800	12,103.00
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990.00
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797.00
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190.00
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976.00
Spondin	Hanna	Dugout	1955	-	1.5	1,000.00
Starland, M.D. of	Morrin	Stockwatering	Incomplete	-	45	3,196.00
Stehr Coulee	Walsh	Multi-purpose Res.	1956	-	26	4,570.00
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988.00
South Macleod	Macleod	Irrigation	1948	6,000	-	82,614.00
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999.00
Swatwell	Swatwell	Multi-purpose Res.	1957	280	300	9,463.00
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652.00
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498.00
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486.00
Two Lakes	Elkwater	Multi-purpose Res.	Incomplete	1,500	1,900	12,562.00
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997.00
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883.00
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904.00
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700.00
Watts Flats	Watts	Flood Irrigation	Incomplete	2,000	-	6,147.00
(Bull Pound-Lone Butte)						



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wheatacre # 2	Rockyford	Irrigation	1952	-	-	4,744.00
Wheatacre Dam	Rockyford	Irrigation	1950	1,600	1,500	12,976.00
Wild Horse Storage	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Wintering Hills	Hussar	Irrigation	1950	1,000	500	9,993.00
Wisdom Water Users	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403.00
Woolford Community Project	Cardston	Irrigation	1955	400	-	3,593.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592.00

# - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

APPENDIX IV  
CUMULATIVE STATEMENT  
Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1958

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (Acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres Per Unit of Live-stock	X		Cost of Operation Revenue \$	Operating Costs \$	Net Operating Cost per Unit of Livestock \$	Average Charge per Unit Live-stock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7			6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1			21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1			43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2			65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7			98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3			111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3			151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1			167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6			198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4			203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1			204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5			211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1			221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4			335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5			438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3			507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9			496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8			499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9			548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0			552,938.40	607,129.23	5.08	4.63
								5,081,951.72	5,115,769.13		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.  
A pasture unit may include one or more pastures, but it is operated under one management.

# APPENDIX V

P. F. R. A. Community Pastures in Operation During the Fiscal Year ended March 31, 1957-58

Community Pastures and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1957	Accumulated Cost of Construction March 31, 1958	1957-58	
				Cattle	Horses
SASKATCHEWAN					
Pasture Units					
Coalfields #4, North Portal	32,380	144,501.23	148,740.78	2,552	47
Estevan-Cambria #5-6, Macoun	6,720	17,216.68	18,168.68	329	3
Masefield #17, Orkney	34,880	90,833.27	100,391.42	1,916	8
Lone Tree #18, Bracken	33,600	86,954.76	93,571.92	2,178	34
Battle Creek #20, Divide	66,880	112,267.53	115,233.66	2,494	21
Nashlyn #21, Consul	61,520	77,963.51	86,554.86	2,362	-
Govenlock #22, Govenlock	68,800	105,247.04	106,567.04	2,415	4
Lomond #37, Pasture #1, Goodwater	23,360	69,010.93	80,189.72	2,158	36
Lomond #37, Pasture #3, Maxim	18,400	68,978.93	71,340.38	1,594	21
Laurier #38, Lomond #37 - #2, Radville	37,175	81,958.63	89,838.71	2,823	38
The Gap #39, Hardy	13,920	49,525.28	84,274.31	1,243	28
Val Marie #47, Val Marie	156,320	249,955.36	257,958.21	7,374	12
Beaver Valley #47A, Val Marie	11,360	25,445.11	25,445.11	679	-
Reno #51, Pasture #1, Robsart	17,120	57,233.59	61,202.89	1,284	11
Reno #51, Pasture #2, Consul	11,360	28,197.48	28,814.38	717	-
Tecumseh #65, Forget	18,400	64,490.77	67,377.91	2,059	35
Brokenshell #68, Pasture #1, Yellow Grass	22,720	57,652.77	69,324.89	1,596	53
Brokenshell #68, Pasture #2, Weyburn	8,160	14,818.47	14,818.47	420	-
Excel-Key West #71-70, Ormiston	30,740	76,038.07	90,871.62	3,049	-
Auvergne-Wise Creek #76-77, Ponteix	42,880	137,158.25	140,173.86	3,161	5
Wellington #97, Tyvan	25,360	98,669.45	103,541.09	3,770	56
Caledonia-Elmsthorpe #99-100, Milestone	26,400	106,048.21	116,307.87	2,425	71
Shamrock #134, Shamrock	26,080	77,574.39	82,798.39	1,860	24
Swift Current-Webb #137-8, Beverly	18,720	77,929.61	81,878.71	1,648	22

Community Pastures and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1957	Accumulated Cost of Construction March 31, 1958	1957-58	
				Cattle	Stock Pastured Horses
SASKATCHEWAN - (Contd.)					
Pasture Units					
Gull Lake #139, Tompkins	10,720	30,650.46	32,362.21	554	-
Big Strick #141, Maple Creek	18,160	43,339.75	44,197.75	1,458	-
Bitter Lake #142, Maple Creek	47,410	111,104.36	118,504.20	2,713	-
Spy Hill #152, Welby (Operated in conjunction with Ellice, Manitoba)	19,570	51,315.25	51,696.15	2,344	27
Elbow #223-4, Elbow	30,080	77,615.14	80,242.45	3,457	28
Beaver Hills #245-6, Homefield P.O.	44,160	111,291.30	115,111.64	2,793	132
Willner #253, Rosemae P.O.	13,280	51,450.24	80,646.25	1,869	44
Coteau #255, Bitsay	27,520	62,818.09	62,818.09	1,478	15
Monet #257, Elrose	46,840	111,055.85	111,055.85	2,931	23
Fairview #258, Rosetown	17,000	82,799.27	114,620.21	826	6
Newcombe #260, Glidden	52,960	162,059.35	164,069.32	3,040	20
Mantario #262, Empress, Alta.	24,960	69,706.80	69,706.80	1,738	-
Mount Hope-Prairie Rose #279-309 (Under Construction)	31,540		61,202.77		-
Wreford #280, Hatfield	13,440	78,916.96	79,731.84	1,231	-
McCraney #282, Davidson	10,720	68,725.24	69,677.74	1,624	-
Rudy-Rosedale #284-3, Broderick	19,200	87,109.35	88,333.45	1,993	45
Hillsburgh #289, Brock	13,600	53,826.64	55,439.48	918	-
Eagle Lake #289-319, Netherhill	22,500	81,258.44	83,830.94	1,155	3
Kindersley-Elma #290-1, Smiley	21,400	112,274.62	112,394.62	1,933	30
Usborne #310, Venn	12,680	37,070.38	41,680.54	1,738	-
Dundurn #314, Dundurn	44,840	110,899.54	111,080.89	1,905	-
Montrose #315, Donavon	20,480	63,329.25	64,591.49	1,227	-
Oakdale #320, Beaufield	20,800	60,411.74	60,512.93	1,169	-
Antelope Park #322, Hoosier	34,320	102,107.61	102,107.61	2,763	13
Wolverine #340, Plunkett	17,280	67,756.85	68,920.05	1,865	58
Mariposa #350, Kerrobert	26,880	88,027.34	88,617.34	1,768	37
Progress #351, Kerrobert	19,680	64,234.48	65,149.48	1,405	15
					-



Community Pastures and Headquarters	Pasture Units	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1957	Accumulated Cost of Construction March 31, 1958		1957-58 Stock Pastured	
				Cattle	Horses	Cattle	Horses

Pasture Units

Heart's Hill #352, Compeer, Alta.  
Park #375, Langham  
Battle River-Cutknife #438-9, Gallivan  
Royal #465, Lorenzo  
Paynton #470, Paynton

SASKATCHEWAN - (Contd.)

15,100	36,272.47	57,845.02	1,312	1
7,040	22,535.62	22,633.89	386	-
30,480	81,983.45	86,009.64	1,284	28
65,120	187,302.82	197,087.61	1,754	37
23,840	70,917.07	76,293.58	1,419	25
Totals for Saskatchewan	1,636,855	4,415,835.05	106,208	1,116

Special Project - Bitter Lake Irrigation included in Bitter Lake Pasture

Pasture Units

Elllice Pasture, Welby, Sask. (operated in  
conjunction with Spy Hill #152)  
Archie Pasture, Welwyn, Sask.  
Portage Pasture, Poplar Point  
Woodlands Pasture, Poplar Point  
Lakeview Pasture, Langruth  
Westbourne Pasture, Gladstone  
Langford Pasture, Neepawa  
Wallace Pasture, Elkhorn

MANITOBA

20,320	28,746.37	28,746.37	1,800	16
39,740	89,249.36	92,063.11	2,016	83
14,640	44,793.85	44,793.85	2,406	26
20,960	68,220.56	68,647.13	2,381	7
29,280	80,530.71	80,724.71	1,322	5
11,520	40,151.47	40,338.67	1,985	27
19,680	65,336.10	70,446.46		
3,280	(Operated by R.M. Wallace)			
Totals for Manitoba	159,420	417,028.42	11,910	164

GRAND TOTALS

1,796,275	4,832,863.47	5,119,317.01	118,118	1,280
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# APPENDIX VI

## MAJOR PROJECTS - IRRIGATION and RECLAMATION

(Projects by Special Votes of Parliament, Administered by P.F.R.A. to March 31, 1958.)

<u>Name of Project</u>	<u>Location</u>	<u>Type of Project</u>	<u>Completed</u>	<u>Irr. Ac.</u>	<u>Stor. - Acre Feet</u>	<u>Costs</u>
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	-	-	\$ 914,448.00
North-West Escarpment Reclamation Project - Riding Mountain Area	Dauphin	Watershed Control	Incomplete	-	-	911,892.00
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	1,950,282.00
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						- 87 -
(b) Development & Construction						2,353,182.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	19,532,912.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	13,061,022.00
						53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00

(Above includes ONLY Construction Costs)

## APPENDIX VII

## PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES

April 1, 1935 - March 31, 1958

		1935-1957	1957-1958	Total
<b>ADMINISTRATION</b>				
Ottawa Administration	(a)	305,714	32,748	338,462
Regina Administration	(b)	1,335,092	152,661	1,487,753
	Total	<u>1,640,806</u>	<u>185,409</u>	<u>1,826,215</u>
<b>EQUIPMENT</b>				
Purchase of Equipment	(k)	1,290,756	199,768	1,490,524
Upkeep of Equipment	(k)	880,114	119,665	999,779
Equipment Depot		1,904,508	305,152	2,209,660
	Total	<u>4,075,378</u>	<u>624,585</u>	<u>4,699,963</u>
<b>LAND UTILIZATION</b>				
Supervision		637,127	47,602	684,729
Construction of Community Pastures		6,705,210	674,685	7,379,895
Pasture Improvements		356,143	107,652	463,795
Operation of Community Pastures		4,372,816	664,313	5,037,129
Purchase of Bulls		595,105	54,415	649,520
Re-establishment of Farmers	(m)	--	--	--
Grass Seeding & Experimental Regrassing		680,526	30,125	710,651
	Total	<u>13,346,927</u>	<u>1,578,792</u>	<u>14,925,719</u>
<b>WATER DEVELOPMENT</b>				
Supervision		785,606	19,158	804,764
Small Projects including Engineering		15,655,118	1,029,343	16,684,461
Large Irrigation and Storage Projects				
Supervision	(d)	1,786,286	70,488	1,856,774
Construction and Improvements	(c&e)	8,066,436	574,855	8,641,291
Maintenance and Operation		5,848,296	361,280	6,209,576
Re-establishment of Farmers	(n)	200,904	15,325	216,229
Surveys and Explorations	(f&h)	1,660,484		1,660,484
Purchase of Land		737,550	14,441	751,991
	Total	<u>34,740,681</u>	<u>2,084,890</u>	<u>36,825,571</u>
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).				
		4,966,394		4,966,394
	GRAND TOTAL	<u>58,770,186</u>	<u>4,473,676</u>	<u>63,243,862</u>

# SPECIAL VOTES UNDER P.F.R.A. ADMINISTRATION

	1935 - 1957	1957 - 1958	Total
Assiniboine and Qu'Appelle Rivers, Surveys and Construction	779,193	249,582	1,028,775
Lillooet Project B.C. Construction & Exploration	1,170,133	--	1,170,133
Land Reclamation & Development in B.C. (i)	1,940,049	--	1,940,049
St. Mary Irrigation Project - Alberta (i)	17,717,575	1,617,640	19,335,215
Bow River Project - Alberta	23,974,416	1,674,158	25,648,574
Red Deer River Project - Alberta	899,976	71,792	971,768
Other Miscellaneous Projects - Construction (g)	210,392	22,855	233,247
Land Protection & Reclamation - Manitoba	2,525,492	337,190	2,862,682
South Saskatchewan River Project - Saskatchewan (g)	4,097,850	295,589	4,393,439
Buffalo Pound Project - Saskatchewan	1,215,785	440,515	1,656,300
Surveys and Engineering Costs (i)	8,751,546	1,771,771	10,523,317
<b>GRAND TOTAL</b>	<b>63,282,407</b>	<b>6,481,092</b>	<b>69,763,499</b>

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147,530.22 expended on St. Mary Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.
- (h) General Survey charges now being paid from other P.F.R.A. Votes.
- (i) Amounts shown in Notes (d), (e) and (f) to be added to this total.
- (j) Veterans' Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P.F.R.A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).



EXPENDITURES BY PROVINCES  
PRAIRIE FARM REHABILITATION ACT and SPECIAL VOTES UNDER ITS ADMINISTRATION  
April 1, 1935 - March 31, 1958

	MANITOBA	SASKATCHEWAN	ALBERTA	BRITISH COLUMBIA
P.F.R.A.	4,815,535	46,639,547	7,557,228	
Major Irrigation and Reclamation in the Prairie Provinces	47,805	6,145,441	45,792,196	
Land Reclamation, Construction and Development in B.C.	2,862,682			3,109,726
Land Protection and Reclamation	981,053	47,722		
Assiniboine and Qu'Appelle Rivers	1,579,366	5,401,369	3,649,556	146,585
Surveys and Engineering Costs	301,205	1,987,936	1,810,039	132,325
Administration	10,587,691	60,222,015	58,809,019	3,388,636
				133,007,361

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REVENUE  
REVENUE RECEIVED FROM PROJECTS UNDER P.F.R.A. OFFICE  
to March 31, 1958

Pasture Operation and General Revenue	5,345,139
Irrigation Project Operation (Under P.F.R.A. Vote)	606,916
Irrigation and General Revenue (Major Projects Vote)	1,770,576
TOTAL	7,722,631

APPENDIX VIII  
TOTAL IRRIGATION DEVELOPMENT - ALBERTA and SASKATCHEWAN

Project	Year Started	Irrigable		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Acreage Ultimate Proposals		Present	Ultimate
Mountain & Foothill Region						
United Irrigation Dist.	1921	21,000	34,000			
Mountain View Irrigation Dist.	1925	3,600	3,600	Driggs Lake	7,500	7,500
Leavitt-Aetna Irr. Dist.	1943	3,600	11,700			
MacLeod Irr. Dist.	1948	2,500	10,000			
Other		12,300	32,700			
Total		43,000	92,000			
Western Prairie Region						
St. Mary-Milk River Project	1901	296,100	510,000	St. Mary Reservoir	270,000	270,000
				Chin	50,000	150,000
				Jensen	14,000	14,000
				Ridge	80,000	80,000
				Verdigris	-	110,000
				Waterton	-	130,000
				Lake McGregor	150,000	250,000
				Travets	100,000	100,000
				Little Bow	12,000	12,000
				Chestermere	3,000	3,000
				Lake Newell	90,000	100,000
				Rock Lake	11,000	11,000
				Crawling Valley	-	120,000
				Keho	40,000	40,000
				Berry Creek Reservoir	30,000	30,000
				Ardley Reservoir	-	300,000
				Buffalo Lake	-	300,000
				Craig & Hamilton	-	250,000
Bow River Irr. Project						
	1918	100,000	240,000			
Western Irr. District						
Eastern Irr. District	1914	200,000	280,000			
Lethbridge Northern Irr. Dist.						
	1922	75,000	96,000			
Berry Creek Project	1938	3,000	8,000			
Red Deer Irr. Project	-	-	300,000			
Other		52,000	201,000			
Total		776,100	1,685,000			

Project	Year Started	Irrigable Acreage		( Live Storage (Acre Feet) )	
		Present	Ultimate Proposals	Present	Ultimate
Central Prairie Region					
French Flats - Valley Park	1949	700	6,000	-	3,100,000
South Sask. Irr. Project	-	-	470,000	-	25,000
Red Deer Extension		-	200,000	-	25,000
Other		13,300	14,000	-	250,000
Total		14,000	690,000		
Cypress Hills Region					
Eastend-Val Marie Irr. Proj.	1937	10,000	13,000	100,000	100,000
				2,000	2,000
				12,000	12,000
				-	80,000
Consul-Vidora Irr. Projects	1945	7,000	10,000		
Ross Creek Irr.	1949	2,000	3,000	4,500	8,000
Maple Creek Irr.	1936	10,000	10,000	10,000	10,000
				10,000	10,000
				5,000	5,000
Swift Current Irr. Project	1940	12,000	21,000	85,000	85,000
				13,000	13,000
Ponteix Project	1953	1,000	3,000	10,000	10,000
Cadillac Project	1953	700	800	1,500	1,500
				2,500	2,500
Russell Creek Project	1951	900	1,200	2,000	2,000
Lafleche Project	-	-	8,000	30,000	30,000
Other	-	67,300	98,000		
Total		110,900	168,000		
Major Reservoirs					
South Sask. Reservoir					
Delisle Reservoir					
Blackstrap Reservoir					
Loverna Reservoir					
Cypress Lake					
Eastend					
Val Marie Reservoirs					
Fifty Mile Reservoir					
Gros Ventre					
Downie Lake					
Junction					
Harris					
Duncan					
Highfield					
Gouverneur					
Cadillac					
Admiral					
Russell					
Lafleche					

<u>Project</u>	<u>Started</u>	<u>Irrigable</u>		<u>Major Reservoirs</u>	<u>( Live Storage (Acre Feet) )</u>	
		<u>Present</u>	<u>Acreage Ultimate Proposals</u>		<u>Present</u>	<u>Ultimate</u>
<u>Eastern Prairie Region</u>						
Lumsden-Fairy Hill Irr.	1910	3,000	6,000	Buffalo Pound Lake	40,000	120,000
Souris-Estevan-Kisbey Irr. Proj.	1937	5,000	11,000	Dead Lake	3,000	50,000
South Saskatchewan	-	-	24,000	Moose Mountain	9,000	9,000
Extension Qu'Appelle	-	20,000	34,000			
Other	-	28,000	75,000			
Total						
Total Irrigation		972,000	2,710,000			
(Alberta & Saskatchewan)						









BINDING SECT. OCT 7 1982





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